

CULTURE DISCIPLINE  
AND DEMOCRACY

VOLUME I

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# CULTURE, DISCIPLINE AND DEMOCRACY

BY

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## FOREWORD

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IF I had been writing wholly from the standpoint of educational tradition, the title of this book would have been *Democracy through Culture and Discipline*. For the first step taken toward democratic education was to ensure intelligent citizenship by making the culture and discipline, which in the past had been reserved for privileged social classes, accessible to the whole people through a system of free schools. Writing as I have done, wholly as an investigator who records in as logical order as he can the results of his inquiry, a truer title for my work as it reaches its completion would be *Culture and Discipline through Direct Preparation for Democracy*. For from the standpoint of culture and discipline as distinct from democracy, I have been forced to see that for the majority of individuals who do not continue to lead the life of academic specialists, no discipline can be lasting or culture continuing which is not closely related to every-day life. And to an education which is democratic only in its opportunity, I have gradually come to add education which is democratic, on the one hand, in its ideals, its subject matter, its organization and its method, and on the other, in compulsion which demands not only that each individual shall have through compulsory school attendance the rudiments of academic knowledge, but, through the compulsion of repetition, every detail of culture and discipline essential to usefulness to the community and the state.

That is, purely academic training, with its general information, general culture, and general discipline, has proved itself

to be not only an uncertain preparation for citizenship, dependent for its own usefulness upon more direct preparation for life, but to depend even for its continuity as habit and system upon its relationship to the every-day experience of ordinary people.

It is, after all, the fundamental changes which the last hundred years have made in the every-day experience of the masses that are responsible for the educational readjustment of which we are just becoming fully conscious. Not only democracy, but the transformation of industrial life, increasing leisure, a higher standard of living, the broadening of social service, and the almost inconceivable extension of the domain of human knowledge are compelling a different kind of education. More than this, as slowly but surely the compulsion of scientific determination is added to that of social readjustment, individual opinion in educational practice must yield to the truth laid bare by analysis, research, and experimentation, as tradition is yielding to changing life and civilization.

Meanwhile, our national educational policy is being widely influenced by two classes of extremists—traditionalists, to whom a liberal education means a discipline and culture remote from life; and iconoclasts, to whom preparation for life is limited to a vocational training which has no time for general discipline or culture. Not only is an open mind one of the highest products of civilization and education, but there is probably no field of investigation, and especially of readjustment, in which it is more difficult to maintain it than in that of education itself. Not merely what is taught, but the method by which it is imparted, becomes a part of one's personality and tends to dominate it, if not through an adequate discipline, at least in point of view. As the life of a particular individual is crowned with success, the vocational training or the general education which prepared for it appears to him to be justified by the logic of experience itself, while the particular form of culture which he possesses, as it raises him above routine, becomes a part of his faith and his

idealism. Indeed, a strong mind cannot be an open one if it is not also analytic. The traditionalist cannot be justly called upon to surrender old beliefs as wholes which are, after all, partial truths, or to accept new ones as wholes which too often represent hasty generalizations as well as scientifically determined facts. Nor can the iconoclast see the partial truths in an old belief when he fails to see it in its parts, or tolerate criticisms of the new when he cannot discriminate between its generalizations and its facts.

This is why, in a period of transition from a variety of deductive educational systems to education as an inductive science, it is so difficult for us to follow "the argument whithersoever it may lead." Fortunate it is for human progress that as educational science is beginning to analyze and experiment, philosophy is becoming pragmatic, culture more truly liberal, and experience expectant and receptive through the continual contributions of discovery and invention to the every-day life of the people. Whether or not each individual is able to meet readjustment with an open mind, the ultimate triumph of analysis, experimentation, and research is sure.

The discussion which is to follow is not so much an attempted solution of the educational problem, as an effort to formulate it. It seeks to analyze the vague presuppositions and generalizations of current debate, and to apply to existing theory and practice the definite facts and propositions upon which a multitude of partial or uncertain truths are collectively based. The result is not an assemblage of deductive conclusions, but a thousand and one specific problems which only experimentation and research can solve. Obviously, if at each stage of the argument the reader is unable to follow the analysis, if he substitutes his accustomed ideas for tentative though cumulative conclusions on which further discussion is based, he will utterly fail to take the successive steps necessary to an intelligent comprehension of the problem as a whole. At best, with an open mind, he can share the writer's hope that both tentative conclusions and the

highly organized system of direct preparation which they appear to justify may soon be put to scientifically valid test. In the educational field, as elsewhere, the compulsion of science must be substituted for that of tradition and displace the individualism which, like that of Protagoras, still makes individual man the measure of all things.

# CULTURE DISCIPLINE AND DEMOCRACY

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## CHAPTER I

### THE PRESENT STATUS OF CULTURE DISCIPLINE AND DIRECT PREPARATION FOR LIFE

#### I. *Conditions Which Have Resulted in a Reaction Toward Academic Specialization*

If not quite unknown to the mass of thinkers, at least in utter absence of that general interest which a realization of their consequences would call forth, two revolutionary tendencies are becoming dominant in educational practice—a continually increasing demand for direct and specific training for definite activities of life and a lessening confidence in the certainty and efficiency of formal discipline. This lack of popular interest is more remarkable from the fact that the present educational crisis is a direct and gradual development of the educational movement of the nineteenth century.

The beginning of the century was marked by a many-sidedness of achievement which widely extended the domain of human knowledge and broadened the range of human interests. It was a period of successful exploration, discovery, and invention, of political revolution, and moral, religious, and social reform. As the revival of ancient learning stimulated sixteenth century scholars to the activities which constitute the Renaissance, so Australasia and the South Sea Islands, Harvey's circulation of the blood and Priestley's discovery of oxygen, the invention of the spinning jenny, the steam engine and the locomotive, the rise of manufactures, the French Revolution and electoral reform, Wesleyanism, temperance societies, homes for the deaf and dumb, abolition, phrenology—these, and many equally

Immense  
increase in  
knowledge  
at beginning  
of last  
century.

potent factors in a changing civilization, united to compel a truer and fuller educational readjustment as yet in its beginning, in whose completion the Renaissance itself will become complete. In America the public school system was created. In England, after the failure of Lord Brougham's Commission to establish a national school system, the Society for the Diffusion of Useful Knowledge was formed, and, through Penny Encyclopedia and Penny Magazine, began its systematic and determined effort to give the new knowledge to the masses. Equally enthusiastic and persistent attempts were naturally made to introduce it into the school curriculum. The elaborate course proposed in all seriousness by Jeremy Bentham, in which this enthusiasm had its culmination, must be presented in its entirety in order to show the quantitative extreme which was reached:<sup>1</sup>

Elementary Arts.—Reading, writing, arithmetic.

First Stage (Age Seven).—Mineralogy, botany, zoölogy, geography, geometry (definitions only), history, chronology, drawing.

Second Stage (Age Eight).—Same subjects, with mechanics, hydrostatics, hydraulics, pneumatics, acoustics, optics. Chemistry: mineral, vegetable, animal. Meteorology, magnetism, electricity, galvanism, ballistics. Archæology, statistics. English, Latin, Greek, French, and German grammars.

Third Stage (Age Nine).—Subjects of previous stages and mining, geology, land-surveying, architecture, husbandry, including the theory of vegetation and gardening.

Physical economics—*i. e.*, the application of mechanics and chemistry to domestic management, involving "maximization of bodily comfort in all its shapes, minimization of bodily discomfort in all its shapes,"—biography.

Fourth Stage (Age Ten).—Hygiastics (art of preserving and restoring health), comprising physiology, anatomy, pathology, nosology, dietetics, materia medica, prophylactics (art of warding off evils), surgery, therapeutics; zohygiastics (art of taking care of animals).



Phthisozoics (art of destroying noxious animals: vermin killing, rat catching, etc.).

Fifth Stage (Age Eleven).—Geometry (with demonstrations), algebra, mathematical geography, astronomy. Technology, or arts and manufactures in general. Bookkeeping, or the art of registration or recordation. Commercial book-keeping. Note-taking.

To all this a certain Mr. Simpson adds:

Sixth Stage (Age Twelve).—History, government, commerce. Political economy. Philosophy of the human mind.

It is this impossible scheme that is used by Joseph Payne to illustrate the fallacy that, because there is so much to be learned in the world, children must learn it all in school.<sup>2</sup> It is absurd only when, in the light of the modern course of study, one thinks of the limitations and inefficiency of the early charity schools. When one turns to the course of study of the Winchester and Etons for which it is intended, with the whole of boyhood and young manhood devoted to an equally quantitative study of Latin and of Greek, Jeremy Bentham's substitute does not appear quite so extraordinary.

The *actual* defense of the traditional curriculum against the onslaught of the new knowledge was the inertia of school men trained through the old content, together with not a little of the religious prejudice which was so potent a factor in the defeat of Lord Brougham's reforms. It was not until the latter years of Mr. Spencer's life that the charge of irreligiousness, brought, for example, against Horace Mann and the Combes, was toned down to such an extent that he expressed his surprise at its almost utter absence.

The *theoretical* defense against a many-sided curriculum in the beginning and, as conservatism began to yield and religious prejudice softened, the only defense was the theory of formal discipline. It, too, reached an extreme which perhaps contrasts itself most sharply with Jeremy Bentham's in Joseph Payne's insistence that "in order to train the mind usefully, concentration and not accumulation must be our guiding principle—in other

Its check  
by formal  
discipline.

words, *we must direct the most strenuous efforts of our pupils to the complete and full comprehension of some one subject as an instrument of intellectual discipline.*"<sup>3</sup> Since this one subject must itself be many-sided in the activities which it calls forth, and must be closely connected with human interests and feelings, Mr. Payne concentrated upon Latin, as opposed to mathematics or natural science. That is, in common with Thomas Arnold<sup>4</sup> and W. T. Harris,<sup>5</sup> he gave Latin prominence, not, with modern Hellenists, on account of a liberal culture remote from life, but because of a humanism and universality which make possible the many-sided relation to modern life, without which the habits fixed with the aid of concentration cannot be generally applied.

Champions of formal discipline are not yet urging many-sidedness as necessary to the general application of the habits which constitute specific discipline. On the contrary, they are beginning to perceive that in failing to insist upon an extreme concentration, logically inevitable if discipline is to be given by branches of knowledge taken as wholes, they ignored one condition fundamental to the fixed habits without which formal discipline is impossible. Mr. Payne himself necessarily prepared the way for a diversity fatal to concentration through a single formal subject by admitting that other subjects than Latin have disciplinary value, and must be included in so far as they do not interfere with concentration upon the subject selected as the main instrument of discipline.<sup>6</sup> A few years later Alexander Bain, with his keen power of analysis, pointed out in a general way the activities developed by each branch, and demonstrated once for all that Latin develops no activity which cannot be developed by some other subject of study.<sup>7</sup> This left no effective defense against the individualism of genetic psychology which, re-enforcing that of Rousseau and later itself re-enforced by Herbartianism, appeared to give scientific sanction to the elective system. So to Latin and, in the secondary school at least, a critical study of English have

**The first  
check to  
discipline,  
decreasing  
concentration.**

been added not only the modern languages, but the natural sciences and numerous other subjects, all justified, at least in part, on the plea of discipline, and all so ineffectively taught, from the disciplinary point of view, as to result in generally admitted failure. Hence, Woodrow Wilson's reference to the social sideshows that interfere with the main performance,<sup>8</sup> and President Lowell's reactionary modification of the elective system at Harvard. The former's most characteristic stand is for concentration on academic work in general through a lessening of distractions and a closer supervision of study; the latter's, for concentration through academic specialization.

The recent recommendations of the Carnegie Foundation concerning college entrance requirements point in the latter direction—concentration on two or three subjects, with free range in a variety of others.<sup>9</sup> Professor Isaac Schwatt took a still more consistent and courageous step when he suggested before the New England Association of Teachers of Mathematics that high school pupils who are not looking forward to specialization in some subject requiring applied mathematics, can be given the discipline peculiar to mathematics through a far more thorough study of arithmetic to the exclusion of algebra and geometry.<sup>10</sup> In short, the apparent but partial remedy of concentration through specialization is being seized upon without regard to its possible supplement or alternative—concentration through the selection and equally systematic organization of material pre-eminent in its direct usefulness to life in general.

The attempt at discipline through at least the elementary study of a variety of subjects as systematic wholes, with its consequent lack of concentration, would not, perhaps, have resulted so disastrously had it not been made in a period of reaction against mechanical memorizing. Since habit is the first stage of discipline, failure to repeat ideas and activities again and again in the unvarying sequences neces-

**Academic concentration not the sole alternative.**

**The reaction against formal memorizing a further check.**

sary to the formation of fixed habits is the immediate cause of a forgetfulness, for which too large a number of sequences is but a condition. One of the most contradictory fallacies into which teachers have been led in the effort to develop self-activity is insistence upon an immediate self-activity which refuses to utilize even a temporary imitation, verbatim repetition, or mechanical prompting, which may be the most direct and effective means to a self-activity truly independent and persistent. On the other hand, immediate self-activity, apperception, and interest, temporarily called forth through the stimulus of an intelligent teacher, will leave behind them pleasant impressions rather than discipline if the potentially most useful of the new associations have not been made definite by drill and the old ones more firmly fixed in the specific relationships upon which their usefulness depends. Mechanical memorizing in unvarying relationships is as necessary to discipline and the independent exercise of rational activities as repetition in continually varying relationships is necessary to apperception and adequate knowledge.

A third reason for failure has been overconfidence in the disciplinary efficiency of the method peculiar to a particular branch of knowledge, to the common and sometimes arrogant exclusion of the pedagogical method through which it can be most economically and certainly mastered. For this an equally arrogant pedagogy has been in part responsible. Until general pedagogical principles are analyzed into specific propositions that clearly apply to the details involved in the teaching of every branch, and the problems revealed by such application are solved by scientific experimentation and research, the failure resulting from the attempt to teach too much and inadequate memory drill will be made all the more inevitable by ineffective methods of instruction. From the standpoint of the formal discipline claimed for the abstract subject, as distinct from the specific discipline more or less adequately given, the chief pedagogic lack is a study of the conditions favorable to general discipline.

**Neglect of  
pedagogical  
method a  
third.**

The culminating blunder of all, possible only to thinkers blinded by the point of view just discussed, is the assumption that the more remote a branch of knowledge from life, the better the means which it affords for discipline. The assumption usually accompanies it that such subjects, through their remoteness, present greater difficulties and demand—and through their lack of connection with every-day distractions receive—greater concentration. Even granting this, it is necessary still further to assume that the resulting discipline once gained is so thorough that it can persist outside the school in the absence of the incidental and continual repetitions possible only to subject matters which are most closely related to life. With the specialist such study, though often specific and narrow, may constitute an exceptionally persistent discipline, because of the very fact that his specialty, remote from the every-day life of the mass, *is* connected with his own. In similar fashion, the specific discipline peculiar to any branch, a discipline which may never become formal or general, depends for its mere continuance upon the persistence with which its essential sequences and relationships are called to mind in the years that follow school life. In the case of students and pupils who are not specialists, with a discipline sought through too much subject matter, with inadequate memory drill in the absence of effective method, the conscious selection of relationships and sequences that do not occasionally recur in every-day life robs them of the last possibility of the continuance of habits which, if formed at all, have been bought too dear.

Remoteness  
from every-  
day life  
fatal to con-  
tinuity.

## 2. *The Lessening Confidence in the Theory of Formal Discipline Itself*

To this conspicuous failure of specific discipline, which could not but weaken confidence in the formal discipline to which it is a condition, and from which most educational

workers and students do not distinguish it, have been added serious doubts as to the theory of formal discipline itself. Its first breakdown came when the new psychology demonstrated that the human mind does not consist of faculties which can be trained into general usefulness. When the memory, the intellect, and the will were seen to be composites of specific activities and habits, formal discipline reduced itself to the operation of a habit in fields of knowledge and experience other than that in which it is acquired. As yet the mass of thinkers have been little influenced by this new viewpoint of the specialist. Although when once familiar with it they will be less impressed by the enumeration of particular activities in so-called disciplinary subjects, which may or may not become habitual or may or may not be carried over, they as yet are more or less under the influence of the grandiloquent plea that the study of mathematics or the languages trains the human intellect, and, therefore, constitutes the most efficient preparation for life.

To expert students of education the results of experimental investigations made by Professors Thorndike, Bagley, and others, tentative though they are, have, on the whole, been a still more disturbing factor. The mere fact that a particular group of mathematically trained individuals compared unfavorably in exact judgments with a group which had not been mathematically trained, or that the habitual proportion of neat papers in arithmetic did not result in neat papers in other school subjects, is perhaps no more convincing than a statistical investigation which shows that a larger proportion of graduates of the old classical course at a certain college have been successful in life than of those trained in the various parallel courses included in the modern curriculum. But the champions of formal discipline have been placed on the defensive, and the great majority of educational thinkers who are at present dominating educational theory and influencing educational practice have at least gone so far as to say, "You may learn to swim by learning to walk, but why not learn to swim by learning to swim?"

### 3. *The Constantly Increasing Strength of the Organized Demand for Direct Preparation for Life*

The popularity of Herbartianism in America has had not a little to do with the development of this state of mind. A many-sided mental activity may result from the adequate study of one or two formal subjects, but the many-sided interest dear to the Herbartian can result only from a many-sided course of study. All this, however, is but one phase of the positive factor which with irresistible force is storming the weakened defences of formal discipline—the organized demand through propaganda, legislation, and confident, though not as yet convincingly successful, practice for direct preparation for each specific phase of life through the teaching of facts and activities in the relationships which definitely and certainly further it.

It is substituting for the maxim, that preparation for college is preparation for life, the equally epigrammatic proposition that preparation for life should prepare for college. In place of first attempting to form the man and then the citizen, it insists that in forming the citizen directly and efficiently equipped for public service, specific right action, healthful living, industrial efficiency, and the ever-increasing period of leisure, it is most certainly forming the man. A step farther, and it will urge that if the habits peculiar to a specialty directly useful to the few, may become indirectly useful to the many by being carried over into the ordinary fields of knowledge and experience, it is more pedagogic and economic to teach them through reorganized courses of study and more effective method, in the relationships which make them directly and certainly useful to the many, with a view to carrying them over to the specialty in whose narrower subject matter they will be useful to the few.

Each succeeding report of the United States Commissioner of Education brings to light new organizations—local, state, national, and international—for the furtherance of moral and religious instruction, personal and public hygiene, patriotic

citizenship, and manual or industrial training. Especially with this latter end in view, state commissions have been appointed, state departments of education reorganized, large appropriations voted, text-books written, and courses of study revised. In the high schools of Pittsburgh and other cities botany or zoölogy, as first year electives, have given place to a "general science," in which certain portions of physics, chemistry, and all the natural sciences are combined to furnish the facts and principles most closely related to every-day experience.<sup>12</sup> Even the term "general mathematics" is creeping into use. The high schools in Berkeley, California, and Chelsea, Massachusetts, recognize as part of their curriculum instrumental music taught at home, if the quality of the instruction is approved by the supervisor of music.<sup>13</sup> A well-known university allows one unit of credit each for editorship and the management of college periodicals. The University of Wisconsin has taken what is probably the most extreme step of all in recognizing forty credits in the theory of physical education and athletics toward the one hundred and twenty required for the A. B. degree.<sup>14</sup>

The closer relating of academic subject matter to life.

#### 4. *Increasing Willingness for Readjustment on the Part of Colleges and Universities*

As yet, even in the face of this tendency, many colleges and universities are continuing to require the traditional type of preparation, including fixed requirements in mathematics and the languages. The University of Chicago, however, is leading the way to a more general recognition in college entrance requirements of subjects essential to general preparation for life, and the Carnegie Foundation, after attempting to gain a consensus of expert opinion, recognizes both the reaction toward formal discipline and the demand for direct preparation for life by recommending more or less superficial examination in a variety of subjects, combined with an increasingly severe examination in mathematics and a foreign language.<sup>9</sup> This will probably be the present answer to the



questionnaire of the special committee of New York High School Teachers, which has been seeking to determine to what extent higher institutions of learning in the East are willing to follow the lead of the West.<sup>15</sup>

"May we ask," says their questionnaire, "what, in your opinion, would be the objections, if any, to the acceptance by your college of the graduates of the high schools of New York City? Such a definition of entrance requirements would secure to the college a four years' preparatory course and would enable the high school to perform its function as a tax-supported institution. Under the present method of defining entrance requirements, students who have not completed our courses of study repeatedly gain admission to college, often to the weakening of both college and high school.

**Questionnaire of the New York High School Teachers' Association.**

"If this departure seems too radical, may we call your attention to the following statements, and recommend the modifications in present entrance requirements which seem to us most urgent? There are seven distinct lines of work which we believe essential to a well-rounded high school course; to wit: language, mathematics, history and civics, science, music, drawing, and manual training. Girls must be taught household science and art. Moreover, we believe that the twentieth century demands that the high schools should not cast all students in the same mold; that the amount of science and manual training which is sufficient for one student is utterly inadequate for another; and that a training for business may be given in the high school which will be as cultural and as respectable as any other course. To enable the high schools to adapt secondary education to the varying needs of different students in such a manner as to meet the diverse demands of the professions, of industry, and of commerce, progress seems to us to require—

"(a) The reduction in the number of so-called 'required' subjects, together with

"(b) The recognition of all standard subjects as electives.

"The specified entrance requirement of two foreign languages, the meager electives in science, and the absence of recognition for drawing, music, household science and art, shopwork, commercial branches, and civics and economics, constitute the chief difficulty.

"We should like to see it possible for a student upon entering the high school to choose Latin or German or French; to confine his work in foreign language, during his high school course, to one such language in case the remainder of his time is required for other subjects; and to find at the end of his high school course that he has met the foreign language requirements of whatever college he may choose to enter. We should like to see no discrimination against Latin for the course leading to the B. S. degree, so that students choosing any language may enter the B. S. course.

"We should like to see the following subjects recognized by college entrance credits:

"Music, 1 unit; mechanical and freehand drawing, each  $\frac{1}{2}$  to 1 unit; joinery, pattern making, forging, machine-shop practice, each  $\frac{1}{2}$  to 1 unit; household chemistry, botany, zoölogy, physiography, applied physics, and advanced chemistry, each 1 unit; modern history, 1 unit; civics and economics, each  $\frac{1}{2}$  to 1 unit; household science and art, 2 units; and commercial geography, commercial law, stenography and typewriting, elementary bookkeeping, advanced bookkeeping, and accounting, each  $\frac{1}{2}$  to 1 unit.

"A recent study of entrance requirements shows that many colleges are already requiring only one foreign language for admission, and that many of the above subjects have received recognition."

The majority of the answers received from the colleges were favorable to these propositions, the most antagonistic being that of President Emeritus Eliot. The most common objection advanced was against the reduction in language requirements. For example, President Garfield, of Williams College, wrote, "So far from abandoning the work in language, I should much prefer that students entering college were

through with the beginners' work in Latin and both modern languages, or with Latin and Greek and one modern language, but I realize that, at the present time, it would appear to put upon the school too great a burden to have accomplished so much." Woodrow Wilson took a similar position, both on the ground that a command of a variety of languages was highly useful and that it is most readily developed in childhood.

5. *Readjustment Must Not Be Left to Consensus, but Must Be Determined by Scientific Research*

Obviously, if readjustment is left to consensus, the resulting curriculum will be a parallelogram of conflicting forces which will probably involve more complete domination of the college by the high school than the high school has ever been dominated by the college. The solution of so fundamental a problem must not be left to consensus. Here as elsewhere science must intervene; not a pedagogy all aglitter with generalities—a peacock plumage borrowed from other branches of learning—but an independent science, with problems which other sciences may suggest, but which it alone can solve. It is high time that in the spiritual domain upon which the future of individuality, the family, democracy, and religion ultimately depends, should be introduced the same analytic and experimental methods that have given us not only atomic weights, electrons, and axis-cylinder processes, but, through invention and manufacture, complex modern life itself. It is strange that education is almost the last of all the great branches of human endeavor to accept the full inheritance of the Renaissance, and to pass from the unity and compulsion of tradition and authority through the progressive but disorganizing dominance of individualism into the more stable unity and more certain compulsion of universally valid fact checked by inductive experimentation and research.

Here, as elsewhere, scientific method must isolate and vary single factors, choose between alternatives, determine

and count relationships. Self-activity must be analyzed into factors, of which discipline and many-sidedness are only seemingly antagonistic parts. Each phase of the educational aim must be analyzed into specific ends, and the whole range of human knowledge and experience searched through and through for the details which definitely and certainly further each in the most many-sided relationships and with the greatest likelihood of recurrence in every-day life. When included in the educational content they must be organized, not merely with a view to the indirect furtherance of these ends through general knowledge and culture, academic habits and general discipline, but in such fashion that, whether facts or activities, they will, through gradual accumulation and reorganization, be definitely and certainly associated with all others that tend to the specific aim upon whose furtherance their direct usefulness depends. Method must be so scientifically determined that there shall be a minimum of waste in the educational process. The groupings most effective for retention and for thought, the form of presentation best adapted to the thing that is to be accomplished, the extent of gradation necessary to self-progress, the length of the interval that can be allowed to elapse before review, these and a multitude of other factors must be measured and compared.

The formulation of these problems should not be left to individual enthusiasts or local effort alone. Just as certainly as there is both a local and a national side to representative government, is there both a local and a national side to the education that should prepare for representative government. The functions of the United States Bureau of Education should be so extended that it can lead in the necessary research.<sup>16</sup>

6. *Direct Preparation for Life More Certain than General Discipline, and Necessary to Make it Useful*

Meanwhile, with all of its present inefficiency, checked as its operation is by the absence of the analysis, experimenta-

tion, and research, without which it cannot be most effective, the advantage of direct over indirect preparation for life lies in the readily apparent fact that it is specific and therefore certain. It is not direct unless it is specific. On the other hand, any effort at general training is ineffective which falls short of habit, which fails to make habit continuing, or which fails to carry it over into the fields upon which even its indirect usefulness depends. More than this, even should the academically well-disciplined man as a result become more generally efficient, in the absence of the direct training which makes certain his good citizenship his very efficiency may make him a greater menace to the well being of the community and the state. Direct instruction, supplementing general training and supplemented by it, finally comes to have the irresistible form of accumulation. Fact added to fact, activity to activity, impression to impression, month after month and year after year, must in the end achieve their common aim. The "line upon line, and precept upon precept, here a little, there a little" of Isaiah, which made the Jew a true Jew, must sooner or later make the American a true American.

7. *Either Academic or Vocational Specialization Without Direct Preparation for Life Hostile Both to Culture and Democracy*

What makes the present an educational crisis is the grave danger that, in a period of educational readjustment so rapid and apparent, a lessened confidence in general training and general culture, with a growing demand for direct instruction, may result in two almost equally unhappy extremes—a professional specialization, which ignores general training and culture, and through reaction, an academic specialization, which, whether disciplinary or cultural, refuses to relate itself to life. The effect of the former is already apparent, first, in the numerous vocational schools which, requiring an inadequate cultural preparation either through high school or college, devote themselves to training for vocational phases

of life; and, second, in the colleges where the cultural courses and the specialized academic courses, which are falsely called cultural, are being crowded to the wall by electives or group electives which, because they are preparatory to vocation, are stigmatized as utilitarian even when as cultural as those which are purely academic.

The natural result is a reaction within the college, which, failing to see that both culture and life require many-sided knowledge, confuses preparation for life with preparation for vocation, and demands an academic education that is not related to life, in place of demanding a many-sided course that is all the more cultural and disciplinary because it is related to life. For example, Dean West, after asserting that the proposed Graduate College for Princeton "is in spirit and substance an institution for humanizing knowledge in the field of the higher liberal studies," proceeds to characterize the "half truth of 'service,' the doctrine that only knowledge of obvious use is worth having," as follows: "Under this notion historical, social, and political studies come to be pursued as a kind of 'contemporary topics' of live interest; the study of literature, even of our own, is narrowed to the most recent periods, thus shutting off depth of background; philosophy descends into the nursery of 'child psychology,' and the great fundamental sciences are neglected except in their most practical applications."<sup>17</sup> Obviously, this somewhat limited characterization of the directly useful is not intended to apply to graduate schools, but to high schools and colleges. Indeed, the recommendations of the three Amherst graduates of the class of 1885, so favorably reviewed by Mr. Roosevelt in *The Outlook*,<sup>18</sup> would result in precisely the independent "republica litteraria" that Dean West considers ideal. They urge that a wholly academic institution shall be created, in which the classical course shall be modified by some addition to science, and taught by the best qualified instructors that adequate compensation can attract, to a limited number of students admitted by compet-

**Direct  
preparation  
for life con-  
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itive examination. There is room for a graduate school in which a broadly humanistic training in the higher branches is substituted for intensive research in some narrow field of knowledge, if, before its students become humanists, they have been given the direct training for life in all of its many-sidedness, which should precede every sort of specialization. But heaven help democracy and culture if future citizens must choose between a professional training that excludes culture and the culture dreaded by old Benjamin Rush when he asserted:

"The study of the Latin and Greek languages is improper in the present state of society and government in the United States. While Greek and Latin are the only avenues to science, education will always be confined to a few people. It is only by rendering knowledge universal that a republican form of government can be preserved in our country. . . . Men are generally most proud of those things that do not contribute to the happiness of themselves or others. Useful knowledge generally humbles the mind, but learning, like fine clothes, feeds pride, and thereby hardens the human heart."<sup>19</sup>

Education for the highest citizenship in a republic demands, as Mr. Roosevelt points out, the addition to "the ordinary and usually more necessary form of training" that is purely commercial of another "which should be undergone simply for the sake of learning and for the benefit of the state." This may be found in Dean West's Graduate School, and is found here and there in others where academic specialization has not been carried so far as to produce the "logician" and the "rhetorician," who five centuries after Montaigne are more likely, after all, to be gentlemen than citizens.

But in place of the new Amherst, unless it, too, becomes a higher school, there must be, both preparatory to the period of specialization, whether professional or academic, and paralleling it throughout, a variety of education which will directly train for moral and healthful living, social and

civic service, the phases of industrial life common to all individuals and such employment of leisure as is not devoted to the specialized culture peculiar to an academic group.

**Even academic specialization can interfere with general culture.** For so broad has the sum total of humanistic knowledge become—knowledge that is humanistic through its relationship to many-sided modern life, as well as to that of Greece and Rome—that there has come to be specialization in culture itself.

And the Amherst plan represents specialized culture that is no truer and infinitely less democratic than the sum total of directly useful knowledge and activity, which, while not connected with wage earning or in any other sense commercial, would constitute a social bond for all classes of educated individuals. So long as the knowledge which is a common possession, either of a particular social group or the whole of educated society, has a many-sidedness that is humanistic and a means to the æsthetic, it is cultural whether its many-sidedness is related to modern or to ancient life. Premature specialization, whether professional, academic, or subjective, is equally hostile both to general culture and to preparation for life. By premature subjective specialization is meant the misleading many-sidedness of a free elective system which, on the plea of adaptation to individuality, excludes much that all students should possess in common, whether as part of a common culture or as a means to the direct preparation for a common life from which a common culture can result.

Obviously, any attempt on the part of the formal disciplinists to make discipline effective through concentration upon two or three branches may constitute a menace both to general culture and to many-sided preparation for life. In the case of the new Amherst, academic specialization would strongly tend to diminish, or at least to narrow, general culture. The problem which here becomes apparent is the extent to which a many-sided course of study at each stage of education necessarily excludes specialization, subjective, academic, and vocational.



### 8. *The Mutual Interdependence of Direct Preparation for Life and General Discipline*

Before it can be discussed, it is well to lay down the proposition that while direct preparation for life, on account of its specific and therefore certain realization of the educational aim, must be given primary place, indirect preparation through general knowledge and discipline is too economical a factor to be ignored. Potentially, there is more economy in a habit or relationship which may be generally applied than in a specific activity. The advantage of the specific activity lies in its certainty. If its general application is made as certain, or even highly probable, its usefulness is multiplied. The fact that general discipline has not been commonly attained is no reason why it cannot be. Toward its achievement, however, concentration, whether through specialization or through effective pedagogical method upon the most directly useful subject matter in the relationships which make it useful, is only the first step. More than this, specific and general discipline are not the only forms of self-activity which certainly figure as means to the development of independent and useful individuality. The first step toward a solution of the general educational problem, that does not represent a mere resultant of conflicting opinions and theories, is an analysis of self-activity into all forms in which it tends to develop permanent and independent right action. Perhaps such analysis may show that culture, discipline, and direct preparation for life are not mutually exclusive, but, on the contrary, supplementary and interdependent.

Direct preparation inadequate in the absence of general discipline.

## CHAPTER II

### AN ANALYSIS OF "FORMAL DISCIPLINE" INTO ESSENTIAL PHASES OF FORMAL SELF-ACTIVITY—INCLUDING GENERAL DISCIPLINE

#### 1. *The Aim of Education Not Self-activity, but Useful Self-activity*

WHILE, as pointed out by Dr. Harris, psychologically all activity of the self is self-activity,<sup>20</sup> self-activity as the educational aim means useful self-activity, as independent and intelligent as possible, in contrast with mere verbatim memorizing and recollection, sensational interest or attention, and mechanical imitation. It does not follow, however, that the act of learning—the method by which self-activity is developed—should never utilize unintelligent memorizing, interest or imitation, but rather that when they are used they should lead as directly as possible to more independent self-activity. The extent to which they should be utilized in a given case constitutes a series of important problems in educational method to which attention will be directed later in the discussion. One of the most absurd and yet hopeful blunders of the conscientious teacher, dominated by the fallacy that all activity on the part of the learner should be self-activity, is the effort to question forgetful children into the recollection of a fact that should be told them, or into the doing of something that should be shown them. "What is the capital of France? Can't you think? It begins with a P. What kind of plaster did we use the other day?" Small wonder if "self-activity" responds with "porous" in place of "Paris." Self-activity is the ultimate end of education, its crowning achievement, rather than an exclusive means which must be invariably used in every stage of instruction.

Closely allied to this fallacy is another equally fundamental, the assumption that an immediate self-activity, dependent upon the stimulus of a live teacher, satisfies the educational aim. Dr. Harris has paid his respects to it in condemning what he seemed to regard as a necessary misuse of the oral instruction which first Horace Mann, and still more influentially Colonel Parker, accepted as the chief means to self-activity: "Oral instruction is constantly liable to destroy the self-activity of the pupil—that is to say, the very merit claimed for it is the one that it least accomplishes. The pupil listens to the teacher's living voice. The first impressions are all he gets, even if he takes notes; it requires time to reflect. The pupil is dragged from one point to another without fully digesting either. . . . He does not acquire the habit of regular systematic study, even though he may foster brilliant, flashy habits of mind."<sup>21</sup>

**Mere temporary self-activity does not satisfy the educational aim.**

Dr. Harris is right in so far as he anathematizes the *exclusive* development of merely temporary activities which, being dependent upon the immediate activity of the teacher, do not appear to be self-activity at all. The modern recitation is too often like the circus procession. The pupils are mentally alert because they are interested, in place of being interested because they are self-active. They thrill at the lady and the tiger, listen to their teacher's steam piano, and follow the clowns and dromedaries whithersoever they may lead. But after a while the procession has passed by. Has anything permanent and useful been left behind?

One sort of permanent self-activity, whose highly potential value has been too largely ignored as a factor in life and in education, almost invariably results—*impression*. The vague and intangible feeling that sometimes rises to emotion, based less on the few things we remember than on the myriad we have forgotten, made stronger and stronger as it is reinforced by successive experiences involving every possible form of activity, but all resulting in the same impression,

**The educational inadequacy of vague impression.**

may in the end become an ideal, a point of view, a permanent interest which constitutes character and determines action. The longing for home, the attitude of labor toward capital and of capital toward labor, love of country, the fear of strong drink, even reverence for deity itself, result far less from definite recollection, specific habits, or general discipline than from the cumulative, and in the end the overwhelming, force of a thousand and one petty forgotten impressions which unitedly tend to a common end.

The temporary self-activity, dependent upon the daily inspiration of the teacher, must not take the place of other essential forms of self-activity necessary to independent and useful development, for some of which, by the way, oral instruction is indispensable. In itself, temporary self-activity constitutes but a highly efficient means to impression which becomes individual and permanent. Its usefulness depends upon the centers to which, through accumulation, the impression attaches itself, the vaguest and most general among them being the school. Love of school may be as playful as the love of the "magic ring" so delightfully described by Kenneth Graham, and, to use President Wilson's figure, attract to the side shows rather than to the main tent, but if useful in no other way, it is worth while.

Owing to the anthropomorphic tendency of children, pointed out by Bain in his criticism of "natural punishment,"<sup>22</sup> love of school will often coincide with love of teacher. Impression, however, is also a means to interest in school activities, in branches of study, in specific phases of the educational aim, and in the fundamental forms of self-activity essential to the mastery of all.

No development of self-activity, in the shape of "interesting" lessons in which pupils have much to do or to say, is useless. It must not, however, be paraded as a pleasant short cut to education, or, through its apparent efficiency, crowd out other fundamental forms of self-activity. The aim of education is not self-activity, but useful self-activity;

not necessarily self-activity that is immediate, but that which is persistent and sure, without either excluding or being excluded by that which, burning brightly for a moment, leaves behind it the same vague pleasureableness as a drift-wood fire or a sunshiny day.

2. *The Necessity for Distinguishing the Educational or Formal Phases of Self-activity from Its Psychological Forms*

At the very outset, then, it is necessary to distinguish between the various forms of self-activity that are educational in the sense of being essential to the development and the right use of all kinds of self-activity—that is, between the various forms of self-activity pedagogically considered, as distinct from the various kinds of self-activity psychologically considered. Much confusion has resulted from, if not an unavoidable, at least a very natural interchange of pedagogical and psychological terms, or the use of the same terms for pedagogical and psychological conceptions. The psychologist would have avoided much vexation of spirit if he had left “apperception” to the pedagogue, while the Herbartian has had reason to mourn over the fact that “interest” is a highly elastic means to psychological and hence to pedagogical expression. The present discussion does not concern itself with such phases of mental activity as judgment, imagination, feeling, and will, but with forms of self-activity by which they are to be usefully developed, and through which the right relationships necessary to their useful exercise must be brought about.

3. *The Five Educational or Formal Phases of Self-activity that Can Be Distinguished Through the Distinct Kinds of Relationships from Which They Result*

Obviously, then, these fundamental forms must be distinguished from each other through the distinct kinds of *relationships* from which they result. An idea or an activity is not useful in itself, but through its recurrence in a relation-

ship which furthers some phase of the educational aim. In the case of *impression*, relationships, most of which are evanescent, accumulate about some central idea or activity. Their sum-total is a feeling which is probably in part identical in its basis with Külpe's "direct recognition,"<sup>23</sup> but whose educational significance lies in its rendering the common idea or activity with which they are associated certainly and permanently as attractive or unattractive as may be useful. The relationships themselves are improbable of recall—the forgotten knowledge and experience which make up most of life in school and out.

On the contrary, *mere remembrance* is based upon the varying and individual relationships which happen for a time to hold an idea or an activity in mind and through which it may be recalled. They will, for the most part, differ with individual learners, and constitute partial, accidental, and even false concepts, no matter how patiently instruction has sought to ensure common and adequate knowledge. Their sum total is information, the knowledge that is power, because it is a mass of memory and apperceiving centers which not only prevent ideas and activities from sinking to the level of forgotten knowledge, but serve as a means of retaining and classifying new experiences that make information more adequate.

*Varying apperception*, the third phase of self-activity, is based upon many-sidedness of relationship. Through it, an idea retained in one or more relationships is made recallable in a continually increasing number of relationships. These relationships may be as individual, accidental, and non-essential, as those on which mere remembrance is based—their function being to ensure variation in mental content, and, through accumulation, both completeness of knowledge and the domination of specific groups or systems of ideas.

The fourth phase of formal self-activity is *specific discipline*, not merely in the sense of the system peculiar to a particular academic subject, but as including all habits and groups of habits. Through it an idea is certainly and permanently

recalled in a definite relationship or group of relationships. It includes the whole gamut of invariable relationships, from the simple habits and complexes of habits useful in direct preparation for life or within an academic branch, through those necessary to general discipline, to the completest possible interrelation of all habits that dominate life and character, whether as a result of experience or instruction.

The fifth and last phase of formal self-activity is *general discipline*—the carrying over of a habit to a field of experience other than that in which it is developed. It must be sharply distinguished from the old “formal discipline” which, through the development of mental “faculties,” was supposed to ensure all forms of mental development. It is neither a “general habit” nor the inevitable result of the study of “formal” or “disciplinary” subjects, but certainly results only when a habit, with a stimulus general enough to be carried over into various fields, is certainly associated with the conditions favorable to its being carried over. Dominant among these are not only specific discipline itself, but the cumulative impression, mere remembrance and varying apperception which the old formal discipline ignored.

#### 4. *Distinction Between Direct and Indirect Furtherance of the Educational Aim*

Of these five forms of educational self-activity, only two—impression and specific discipline—are based upon the direct and specific relationships that alone can be made certainly useful. The habits resulting from experience are, and the impressions may be, specific and certain, but not necessarily useful. On the other hand, no relationships are certainly useful unless they specifically, and hence directly, further some phase of the educational aim. It is obviously the function of instruction to make certain the specific relationships giving rise to habits and impressions essential to the direct furtherance of each phase. More than this, as will be later

demonstrated, specific and certain relationships are as essential to useful remembrance, apperception, and general discipline as the varying relationships of apperception are necessary to the multiplied usefulness of specific discipline. Mere remembrance, varying apperception, and general discipline, while not certainly useful, tremendously multiply the usefulness of the specific relationships which are.

The educational aim, then, is realizable through five forms of self-activity—directly and certainly through specific discipline and impression, and indirectly and potentially through mere remembrance, varying apperception, and general discipline. The problem of correctly apportioning the time available for instruction, between specific discipline and the indirect furtherance of the aim, belongs to method. In its solution three facts are fundamental—first, the primary importance of specific discipline not only in itself, but as a condition to indirectly useful self-activity; second, the limited number of specific relationships so essential that they must be made certain; and third, the limited time which, from the standpoint of attention and fatigue, can be effectively spent in memory drill.

A somewhat more detailed discussion of each of these five forms of educational self-activity will make clear their inter-relationship and demonstrate their interdependence.

### 5. *Cumulative Impression, a Directly Useful Phase of Formal Self-activity*

While in a school where instruction is carried on by a teacher intelligent enough to be misled by the will-o'-the-wisp of immediate and temporary interest, education may become too nearly a passing show, in which impression for the most part narrows itself to a love of teacher or of school, other forms of educational self-activity will be present, and impressions will be usefully associated with other things than school. In fact, precisely the same type

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of instruction that predominantly results in mere impression, also fosters varying remembrance and apperception. In this it is educational as far as it goes, but only indirectly so. It fails to develop specific discipline. Failing to result in specific discipline, and consequently in general discipline, even its indirect furtherance of the aim is inadequate.

This combination of variable impression, remembrance, and apperception constitutes what W. H. Payne was accustomed to call the "tonic" value of education.<sup>24</sup> If developed at the expense of discipline, its finished product is the individual justly referred to by Dean West as educated but not intelligent.<sup>25</sup>

Assuming that impression is developed with due regard to the other forms of educational self-activity, the chief danger is that it will not be so centered and accumulated as to aid in ensuring the permanent viewpoints, ideals, and motives essential to the various phases of the educational aim. The cumulative impressions left behind by the school work may and should result in permanent interest in various branches of study. But they must involve something more than a love of school or even of the academic subjects that are taught there. In fact, a teacher may leave behind him impressions that result in love for him and respect for his ideals without developing the love for essential school subjects at all. One of Mr. Quick's old Cranleigh boys, after stating that all his subsequent life had been "stayed by his kindly hand and cheered by his kindly voice," goes on to say, "I was also in Mr. Quick's class, though for what subject or subjects I have forgotten."<sup>26</sup>

**Impression  
can operate  
against the  
educational  
aim.**

By far the most important results of the impressions made certain by the school are the ideals, the viewpoints, the attitudes of mind, and the tendencies that directly further the details, which together constitute the various specific phases of the educational aim. Just what these details are, analysis of the various phases must determine. For example, it is highly essential to the furtherance of the

aim that the form of self-activity now being discussed as *impression* should play its part in developing faith in divine providence, determined opposition to anything which menaces the public health, an earnest belief in the doctrine of equal rights as opposed to special privilege, or any other detail necessary to right living, good health, industrial efficiency, social service, good citizenship, and the proper employment of leisure. Conscious effort in the formal educational process to make impressions provoke interest in such details has of necessity been occasional and limited, in the absence of the analysis which alone can determine what details are necessary. At the worst, the cumulative force of impression is used against the school, or, through force of external experience, in favor of activities that are conflicting with or hostile to its activities. On the one hand, dislike of teacher, lack of interest in studies, impatience of routine, reaction from purely academic existence, discomfort from unhealthful or unnatural environment—hourly, daily, week after week, month after month, and year after year; on the other, love of play, the joy of motor activity, the social companionship of chums or the “gang,” the longing to make money, moving pictures, the theater, the lure of real life.

Sometimes the solution seems easy when the introduction of some one of the many possible sources of interest into the school makes the school interesting. It is a temptation, for example, to look upon manual training as a panacea, and to depend upon it to hold the motor and construction-loving boy to his task. The sympathetic teacher, vocational motive, school city, each often serves to remove a hostile condition within the school and at the same time to check antagonistic forces without. Such solutions are but partial, and substitute favorable and even, in the case of particular individuals, necessary conditions to success for the elements essential to the useful development of all. Pupils may love their teacher, their school, and their work, and students their college without gaining the permanent impressions funda-

mental in the realization of the aim to which teacher, school, and work are but conditions and means. Desirable as interest in the whole school environment is, it is better that it should be lacking than that it should be permitted to take the place of a constantly increasing attraction toward what is useful in life and antagonism for what is evil. When the learner, day by day and year after year, is consciously accumulating the impressions which directly and certainly make for respect for law and the equal rights of others, a love of justice, truth and honesty, devotion to all necessary work, interest in the common good, the useful feelings which, if persistently enough and effectively enough sought, will in the end dominate life and character, he will in most cases come to love the environment with which such teachings are associated. None the less, as Compayré says of pupils in relation to school discipline,<sup>27</sup> and Münsterberg of those to whom through heredity it is easiest to lead criminal lives,<sup>28</sup> every one of us has the right to the sum total of influences, conditions, and means, whether essential or non-essential, weak or potent, that tend toward the right.

**Impression must re-enforce the most useful ideas.**

Of course, interest—the feeling of attraction or repulsion—is incidentally and variably associated with ideas and activities, through mere remembrance and apperception, as it is definitely associated through specific and general discipline. But mere remembrance, with its incidental feeling, and apperception, with its changing interest in many relationships, cannot ensure the continual repetition of experiences certain to stimulate in ever-increasing degree a common feeling in a common idea or activity. Specific discipline must first, through certainly associating exceptionally impressive incidents or passages with the common centers, ensure for it a definite and permanent emotional nucleus, about which the mass of vague and forgotten impressions can multiply. Such an association transforms an idea into an ideal whose application becomes increasingly sure. And every application

**The efficacy of emotional centers.**

of such an idea or activity through general discipline either adds to the fixed emotional nucleus or to the impressions for which it is the center. The fundamental ideals, points of view, and motives in life must not be left either to chance or to the certain recall of a few unemotional facts. It will take more than scientific temperance instruction to compel total abstinence, or than the principles of civil government to bring about good citizenship. But impression re-enforced by habit and habit by impression can come to have the force of instinct and heredity.

6. *Initial Remembrance, the Phase of Formal Self-activity Which Holds Ideas Until They Can Be Variably Apperceived and Specifically Memorized*

The second form of self-activity, from an educational rather than a philosophical or psychological viewpoint, is indirect recognition or initial remembrance. Back of direct recognition lies the same mass of forgotten experiences which, concentrated in some particular direction, constitute impression in the sense in which we have just discussed it. It is in their physiological basis that Külpe finds a possible explanation for the immediate judgment of familiarity.<sup>23</sup> In contrast with this, back of indirect recognition or initial remembrance, lies some definitely recallable association. It does not at all matter what it is, but only that it is definite and readily comes to mind. Unless it has as its basis a single relationship, it involves but partial comprehension and is dependent upon a partial concept. The two distinguishing characteristics of the partial concept are, first, the fact that it is partial, and, therefore, gives rise to the initial remembrance that may ultimately lead the way to an adequate concept and fuller comprehension; second, the fact that though definite, in so far as it is dependent on ordinary experience, it is accidental, and consists of relationships which vary with occasions and individuals.

Initial remembrance usually based on partial concepts.

This variability is equally true of the relationships upon which recollection depends—the chain of associations that determine ordinary thought. Any one of the relationships ensuring remembrance may result in recall, and may, for the time being, constitute the remembrance itself.

Investigations of Mr. Earl Barnes and others have shown that the minds of developing children are full of such partial concepts.<sup>29</sup> The monk is not the self-sacrificing member of a religious order, but the chipmunk or, better, the individual who sends out St. Bernard dogs to rescue children lost in the snow. The clock is something that ticks or tells the time. Sometimes, as in one instance in President Hall's well-known study, a concept is incorrect because it is partial.<sup>30</sup> The unfamiliar cow was supposed to be no larger than the familiar mouse. Quite often the concept is both partial and incorrect, as when a high-school girl who had heard of pirates defined a pilot as a sea robber. Even here, as is usually the case, there is a partial truth in the absurd misconception. Both pilot and pirate are spelled with *pi* and *t* and have to do with the sea.

The laugh that rises from such misapprehension is generally turned against the school. Its work is not being well done. Children are attempting studies which are too difficult, learning too fast, or, at any rate, being imperfectly taught. The usual effect of such investigations as that of Mr. Barnes has been agitation for more adequate knowledge. "Let us see that children know thoroughly what they get, even if they get but little. Every word in the reading lesson must be spelled and defined. Pupils must be questioned into complete comprehension of all which they pretend to know at all." More than this, the scientist of a certain type steps in and insists upon exact knowledge. Physicians scoff at physiology primers because learners in pinafores speak of the heart as a pump. Physiographers despair because youngsters look upon volcanoes as mountains.

All knowledge cannot be adequate.

Nothing could be more fatal to self-activity in general than insistence upon completeness of comprehension. The number of ideas that can be remembered in all the specific relationships necessary to define them is relatively small. Most concepts of adults as well as children are not only recognizable, but capable of recall only through some partial, non-essential, and, frequently enough, false or absurd relationship. It is the function of initial memorizing or mere remembrance, based as it is upon any relationships at all, to hold an idea in mind and to make its recollection possible and definite. Such a simple relationship, however, constitutes the very germ of mental growth. Without it, fuller self-activity would be impossible. Partial concepts are points of attraction for all related ideas. They constitute association centers, apperceiving groups which reach out after new experience. Facts, activities, impressions that would otherwise be forgotten, cluster about them. In a broad sense, education itself can be looked upon as the addition of one relationship after another to a partial concept until it is relatively complete. The greater the number of partial concepts, the greater the opportunity for development. The absence of a partial concept leaves many an experience without a means to the development of self-activity. One helps in retaining and developing the other. Without the interrelationships that come to exist between the many, the few are more likely to be forgotten. "To him that hath shall be given, from him that hath not shall be taken away even that which he hath." Even in adult life, in the most complete and most useful forms of self-activity, the partial concept must be the point of departure. The flash of temporary insight, the perception of a new relationship, more readily forgotten because it is the product of accident or inspiration, may lead to the writing of a *Thanatopsis*, the invention of the telephone, or the building up of a hypothesis that explains the movements of the celestial spheres. No wonder that Dr. Holmes exclaims, "When found make a note of it."

The more stories that are told to children, the more they hear of intelligent conversation, the more they read or have read to them from miscellaneous books and periodicals, the more they travel, hear lectures, and see moving pictures; in short, the broader their environment and the more many-sided their experience, the greater the opportunity for partial concepts. The better the native retentiveness of the children, the more they can profit from the opportunity. It is an important function of the home, the press, the church, and public amusements to provide all children with this broad environment and many-sided experience.

In the school, the resulting partial concepts and partial comprehension should not be scoffed at as incorrectness and foolishness, or mourned over as failure, but welcomed as essential means to still further development. At every stage of advancement the learner should be tested for incidental information as well as for adequate knowledge. He should be asked of each idea, not only—do you remember it in this specific relationship or group of relationships, but, in what relationships do you remember it? In college and university, as well as in elementary school, instructors should make sure that every individual is getting not only the few essential ideas in the specific relationships which make them useful, but that, in addition, he is getting in each branch he is studying as many ideas as possible, no matter what the relationships in which he holds them. There is the same distinction between a vacant mind and one filled with incidental and partial concepts as between a desert and a garden.

This recognition of the partial and the variable may, at first thought, appear to encourage the carelessness in teaching to which the presence of partial concepts in children's minds has commonly been attributed. On the contrary, it will result in far more careful teaching. It is the recognition of the fact that a particular relationship or group of relationships, directly useful to the aim or to some branch of study, must be repeated with sufficient frequency to ensure the

**Both exact and partial concepts to be taught and tested for.**

specific discipline involved in their exact and ready recall by the whole mass of pupils taught in common. Otherwise, if remembered at all, they will not only be partial and include non-essential parts, but will vary with individuals, and frequently add to themselves or have substituted for them accidental or absurd relationships. Just what relationships should be readily and exactly recalled must eventually be determined through research into their relative usefulness; and just what number, through research into the amount of time that can be effectively spent each day in the memorizing of new material or the repetitions and reviews necessary to adequate retention.

Haphazard partial concepts cannot be recognized except through contrast with partial relationships that are essential, and useful relationships not partial, the necessity for whose ready and exact recall through adequate repetition is thereby emphasized.

If Mr. Bain is right in his assertion that memorizing is the most exhaustive phase of mental work,<sup>31</sup> ample time will be left for the development of impression and mere remembrance through the presentation of a multitude of facts and activities which cannot be certainly memorized in exact relationships. It is at this point that realization of the value of mere remembrance most directly tends to more careful teaching. Remembrance is most useful when the relationships to which it is due are true and essential relationships. Here the formal step in the recitation which the Herbartians have popularized as "preparation" ensures carefulness. It is the calling to mind in the pupils of past experiences, which can be usefully related to what is to be taught. It seeks to detect the partial concepts which will be most useful, in case they exist, and, by stirring them into activity, not only tends to give the new experience a greater likelihood of remembrance, but to determine the relationships in which it will be remembered. The partial concept, if it is a partial one, is made selective and more complex; the new one is remembered in useful relationships.



But, notwithstanding the carefulness which makes certain and definite by adequate repetition as many useful relationships as possible, and which through "preparation" gives greater likelihood and usefulness to remembrance, much that is taught will be remembered, if remembered at all, through non-essential, accidental, or absurd relationships with recollections which the teacher did not touch in spite of his skilful questioning, or which he incidentally revived without knowledge of their revival or their existence. After all, remembrance is useful as mere remembrance. The partial concept may become complete, the ridiculous relationship will be forgotten or remembered as an amusing blunder; but the indispensable condition to the future usefulness of an idea or activity is that somehow or other, in some way or other, it must be kept in mind long enough for it to be made fast by one incidental association after another.

**Mere remembrance useful, even when undetermined.**

The teacher should never deliberately choose the non-essential or accidental relationships where a more useful one can be formed. But all children should be given in school the many-sided experience that more fortunate children get outside. Ultimately, all should get it by every possible instrumentality outside.

It is not merely many-sided experience that is needed, but many-sided experience so directed and controlled that it is most likely to be useful. Travel, family trips, school excursions, collecting expeditions, visits to museums and art galleries, stereographs, stereopticon views, realistic fiction, dramas, moving pictures that do not present what would be punished or suppressed in real life as immoral or illegal; plenty of interesting periodicals and newspapers, with their good and evil; collections of all sorts of specimens, changing as children's interests change; all sorts of books which, not being juvenilized, give partial concepts of useful wholes; sermons and lectures not fully within the comprehension and interest of children but not too long; oratorios, musicals, luncheons,

**Need for useful many-sided experience.**

parties and receptions; conversations, discussions, and opportunities to listen to conversations and discussions not fully understood; above all, patient and intelligent replies to childish questions; all these and other experiences should not only be brought about, if necessary, by or through the school to children, who without such intervention would lead abnormal "shut in," crippled, oriental lives, but should be consciously selected and directed with a view to possible relationships which may further the various details of the several phases of the aim. As partial concepts, the roots, the seeds, and the sucklings of self-activity are formed and held in children's minds by all sorts of inconceivable and kaleidoscopic catchalls and garden spots, it is easier to determine what is to be given the chance of taking root than what it is to be rooted to.

Finally, it must not be forgotten that mere remembrance is in itself a pleasurable form of self-activity. It is as interesting to know in part as to fully know where one, for the time being, takes the part for the whole. Especially with children, ready recognition of the experience as it appears to them, ability to in some fashion or other answer the question who, what, when, or where, indeed, to answer any question at all, is part of the joy of living. This many-sidedness is as necessary in higher education as in the training of the child. While the "side shows" of the college course must not take the place of the "main tent," the main tent must not exclude the side shows. College life must be many-sided, not only for the sake of recreation, but as a means to the mere remembrance and varying apperception which must supplement specific discipline if education is to be complete. Enjoyment of music, art, and the drama—where possible, through membership in musical or dramatic club—reading along lines of individual interest, membership in literary societies, participation in political activities, leisure for ramble in country or woodland, above all, participation in social life, not merely in the democratic sense proposed by Dr. Wilson, but in that of a natural and congenial social group, far from

**Many-sidedness of experience essential in the college.**

being tabooed as a menace to the real work of the college, should be required and compelled as an essential part of it. College life should only in part become a mechanical routine. The boyish prejudice against the "greasy grind," meritorious as his achievements may be, has again and again been justified by the failure of valedictorian and salutatorian to carry over their efficiency from school to life. To many-sided application, many-sided knowledge and experience are as essential as routine. If modern education cannot include and dominate every phase of life, as Rabelais made it include, and dominate the daily experience of Pantagruel, it must at least see that due recognition is given to all that tends to develop the versatile and imaginative man of affairs.

7. *Varying Apperception, the Phase of Formal Self-activity which Ensures the Many-sidedness of an Idea and Its Interconnection with Others Not Permanently Related to It*

In its most general sense of many-sided relationship apperception is far more inclusive than in the sense to which I have applied the term varying apperception. General discipline may itself be regarded as a form of apperception—the "generalization" and "application" of the Herbartians. Specific discipline, as it is developed into complicated systems of thought in which groups of associations react as certainly as one, is apperception. But in the latter form apperception is unvarying, and in the former variable only in its operation. It is uncertain, but specific.

Apperception itself may be specific in its presentation—and, so far as it is a means to instruction, should be,—but a group of relationships when once presented in some specific form will either give rise through unvarying repetition to specific discipline or, in its absence, become apperception that is varying.

The partial concept, held in mind by mere remembrance, through lack of recall sinks to a mere impression which may or may not be useful. If sufficiently recalled to be permanently retained, it either tends, through unvaried repetition

in essential relationships that have been added to it, to become an adequate or at least a definite concept and a means to specific discipline, or, through repetition in varying relationships, to become a full concept, and hence a means to varying apperception, and, as will be demonstrated later, to general discipline itself. Effective education demands both unvaried and variable repetition, and each results from incidental experience.

The only educational value possessed by varying apperception, as distinct from discipline, lies in its variability, in the fact that through it any idea in the human mind may be related to all others, and a specific relationship find its accustomed stimulus in fields of experiences remote from the one in which it is formed. It is the main correlating force in education, establishing a thousand and one different sorts of relationships for each idea figuring in individual experience. It is the fact that through it an idea may recall a multitude of other ideas, or be recalled by any one of them, that gives it its educational function. Its principle which, with all the exaggeration of recent fad and theory, is not yet sufficiently popular, is—repeat each useful idea in continually varying relationships. Some, differing in the case of every individual with individual experience, will through incidental repetition become permanent and result in specific discipline. The mass of them, for the time forgotten, constitute the potential energy of the individual mind, latent until some favorable condition causes the idea to recall them or them to recall it, to serve in turn either a specific or varying function. An apple drops from a tree, and in place of eat, wind, dodge, bruise, or any other association to which apperception has related the idea which is its symbol, Newton thinks of fall, of gravity, and then of other falling spheres and gravity. If hungry, he might have thought of eating it, if he had been hungry the day before—of colic. But, after all, it was by no mere chance that, in the absence of strong and immediate association pointing elsewhere, his thought turned to the

Varying apperception the chief means to recall.

stars. The presence of various incidental and changing conditions psychologically determines the selection of the relationship which any fully apperceived idea will suggest. But back of this lies a more permanent condition which can be pedagogically controlled—the existence of groups of ideas, great apperceiving centers, variable in their relationships through their multiplicity, but dominant through the fact that they are continually called to mind. If a cook, a poet, or a huckster had been under Newton's tree, he also might have recalled food or colic, but, failing some immediate distraction, he would not have thought of gravitation. Just as Newton naturally pictured volumes, concentric spheres, or the greater velocity with which apples higher in the tree would hit the ground, the cook would have recalled applesauce, roast pig, or pie; the poet, the "Planting of the Apple Tree," "The Last Leaf," or "The Apple of Discord," and the huckster, market price or bushel measure.

The application is clear. No one relationship or fixed group of relationships can be made certain of recall by varying apperception, but the recall of some one of the relationships belonging to the mass and through it of others, and always, vaguely at least, the central idea with which all are associated, is made exceedingly probable through an ever increasing many-sidedness. The educational use of apperception lies first in mere many-sidedness, in making it possible for any two ideas to be re-associated. However incidental and unimpressive their association may be, the relationship has been formed, and in some flash of recollection or of insight may serve as the connecting link between ideas, activities, and experiences otherwise remote. But second, it lies not merely in making a concept fuller, but on account of its frequent recurrence in varying relationship, in making increasingly probable the recall of any one relationship and in far higher degree the relationship which constitutes the concept itself.

Many-sidedness of relationship makes an idea dominant.

Just as through their continual and many-sided recurrence

occupation, money getting, food and clothing are naturally made dominant in experience, so must instruction artificially ensure the continual many-sidedness necessary to the dominance of morality, health, efficient industry—as contrasted with mere occupations,—citizenship, social service, and right recreation. Multitudes of associations must be cumulatively formed about each specific phase of the educational aim—both for the sake of the many-sidedness which makes it possible of association with every field of experience, and for the sake of the repetition which makes it dominant in recall.

“Whatsoever things are true, whatsoever things are honest, whatsoever things are just, whatsoever things are pure, whatsoever things are lovely, whatsoever things are of good report; if there be any virtue, if there be any praise, think on these things.”

This “concentration” of many-sidedness about fundamentally useful relationships is essential to the realization of the educational aim, and is employed by “Concentration” demands useful system. Herbart as an antidote for a purely incidental variation in recall. Without it many-sidedness may give rise to a sort of “Banderloggism”—the state of mental instability of which Kipling’s jungle people accuse the monkey tribe.

To such useful concentration, neither “the five formal steps”<sup>33</sup> nor correlation constitute certain means. Through effective “preparation” and “presentation” new ideas may be associated in a many-sided way, and so further variation and reorganization of relationships. Even “generalization” and “application” may ensure merely a broader range for variation. Concentration is brought about only when generalization, made permanent in its general form, results in useful *subordination* or *systematization*; in the recognition of the idea as associated with the groups in which it will be specifically useful, and to whose specific usefulness it will add, or as specifically establishing a new relationship many-sided in a usefulness of its own. This is equally true of correlation. Indeed, assuming that it avoids the absurdities of

artificial apperception, the lamb-haunted school session made classical by Bardeen, or the "do-bird" and the "re-bird," which Findlay found connecting music and nature,<sup>34</sup> its concentration being that of branch with branch, tends to become academic, and so useful from the standpoint of specialization rather than that of a general education. Whether in general or in specialized education, however, useful concentration—the cumulative usefulness of apperception as distinct from its usefulness as a means to variation—is dependent upon the varying apperception of an idea made certain in some definite relationship or group of relationships. For example, the mere name Lincoln, and usually the fact that he was President during the Civil War, can be recalled by humorous anecdotes, assassination, school holidays, Gettysburg, emancipation, or any other of the many-sided relationships in which Lincoln's Birthday celebrations have made it familiar. The more many-sided the association, the more frequently the name Lincoln is recalled, and the more frequently it is recalled, the more likely its recall or that of any one of the ideas to which it is related, as opposed to possible alternatives. But mere cumulateness and frequency of recurrence does not ensure concentration, but rather the pathways through which useful relationships and groups of relationships can get into contact with other ideas and relationships. A mere name can reorganize mental content, but it cannot dominate life and character. In place of a name, there must be definite and certain relationships—Lincoln's faith in divine Providence, his sympathy as illustrated in the letter to the mother who had lost her son, the democracy of his Gettysburg address—or all others that relate the many-sidedness of Lincoln to the essentials of religion, citizenship, or any other phase of the aim. These essential relationships *must* be recalled; the varying ones *may* be. The essential ones must be drilled upon until the name eventually suggests them, just as religion must eventually suggest faith and sympathy, and citizenship democracy. This done, the variation

Specific groupings essential to concentration.

and reorganization to which many-sidedness is the indispensable means will ensure useful concentration. The essential ideas that dominate life are not only made more certain of recall, but a means of contact has been forged for them, with a vast number of shifting and changing ideas. Specific discipline must supplement varying apperception if there is to be useful concentration, just as varying apperception must supplement specific discipline if there is to be general discipline. Mere remembrance and varying apperception incidentally provide the means by which the greatest possible number of ideas may recall each other. It is the function of specific discipline to see that the ideas most frequently recalled and recalling are recalled and recall in essentially useful relationships.

Through varying apperception the essential relationships of life can be carried into any field of experience. Its variation differs, however, from that of *cumulative impression*. There, varying incidents and ideas resulting in a common feeling are associated with a common idea. The more they accumulate, even though forgotten, and the greater their variation, the stronger the feeling aroused by the common idea, especially if the form of each is adapted to the development of the feeling in high degree.

With *varying apperception* each new association may result in a different impression, which may modify instead of intensifying the feeling that impression makes sure.

To sum up the educational function of varying apperception, on the side of knowledge it serves to develop full or at least broader concepts; to make ideas many-sided in their relationship. From the standpoint of self-activity this many-sidedness is useful in two ways. First, it associates an idea with as many other ideas as possible, and so, both through their possible recall and association through them with still other ideas, furnishes the means for carrying it into any field of experience. Second, it makes more probable the recall of the idea, in continually varying relationships—every successive re-

Varying apperception may be hostile to cumulative impression.



call making the recollection of the idea and of each of its relationships more probable as compared with that of other possible associations with which they must continually compete.

From the standpoint of instruction the fields of experience opened to each idea through this first use of varying apperception must, so far as possible, include those in which it is known to be most useful. A few relationships in which it will be highly useful—especially if they are typical of distinct fields or kinds of relationship—should be made certain through specific discipline. So far as the time available permits, many more known to be useful should be associated even though they will be at once forgotten, or be variously held in mind through miscellaneous remembrance. Always possible of recall in the original relationship, useful concentration will make them increasingly likely of recall. In the case of individual learners a few relationships will continue to be recalled in their original form, and so will become specific even in the absence of specific discipline through instruction.

The most  
useful  
varying ap-  
perception.

But over and above the many-sided relationships in which the relatively most useful ideas are known to be useful, are an immeasurable number of relationships in which they may become useful. From this point of view, miscellaneous and varying many-sidedness, apperception merely for the sake of apperception, the accidental as well as the necessary relationships of every-day experience, become educational. Relations may be added that are artificial, remote, or absurd. The naturally imaginative mind, probably based upon a brain in which associative fibers readily grow, will bridge over the gaps which instruction and experience leave behind. But both to the imaginative and to the unimaginative, made in part at least imaginative as children by fairy story, romance, tales of invention, and books of travel and of golden deeds—constructive and imaginative experience and instruction must be given at every stage of educational development. They probably need imaginative material more in the culture epochs

Varying ap-  
perception  
through im-  
agination.

of sense-perception and judgment than in that of imagination itself, which theoretically and perhaps biologically lies between. They must form the special habit of synthesis, not only in so far as it involves the recombining of the material immediately presented to the mind through experience, but where it must leap over time or space, through incidental or even temporary relationships, to ideas until then unassociated. The "bromide," if truly educated, must become, in part at least, a "sulphite." The man in the orchard must have some of his ideas among the stars.

Old Sir Thomas Browne's evils of the imagination<sup>35</sup>—the dangers rising from an unrestricted apperception which may put ideas into new relationships that are harmful, are, through this educational use of varying apperception, directed and regulated both negatively and positively. Negative prevention is practicable only through *impression*, in which some evil idea or idea group, certain to rise from experience, has associated with it a cumulative mass of material which will result in a growing feeling of repugnance or repulsion. To point out or to caution against associations that are merely possible in their evil has all the suggestive force of "Don't put the cat in the oven." Positive prevention results directly from limiting the varying apperception of instruction to relationships known to be useful, and indirectly from the Froebelian dominance of counteracting groups of useful ideas which concentration continually makes stronger. When the seal is once broken, the genie of imagination does not have to be put back into the vase.

Again, from the standpoint of instruction, the continually increasing frequency of recall, which constitutes the second phase of varying apperception, must not tend to bring to mind only a central association that is a mere abstraction, or one or more of the ideas to which it has been related, but the specific relationship or group of relationships in which the central association is most useful. That is, the

**Specific  
discipline  
essential to  
useful  
varying ap-  
perception.**

central idea itself must be the most useful relationship with which the useful many-sidedness can be associated, made definite and certain through specific discipline. For example, the notion of rights may be associated through incidental experience with woman's rights, punishment for misbehavior outside of the school grounds, self-defense, trespass, the carrying of canes by freshmen, the right to take a drink if one pleases, Jim Crow cars, a freedom from arrest when within the law, public school education, and a multitude of other things associated with what one has or has not the right to do. But certain specific relationships fundamentally useful should be so certainly associated with the notion of rights that they will be recalled when it is recalled. At least, consideration for the rights of others, the lack of moral necessity for and the unwisdom of always demanding one's own, the dominance of moral over legal right, and the fact that political equality not only demands for one's self rights equal to those of all citizens, but for all other citizens rights equal to one's own—should be so repeatedly drilled upon in connection with the idea of rights in general that they will always be suggested by it and one will always suggest the others. Then, through instruction, there should be associated with the particular sort of right with which it belongs, inquiry as to whether raising a car window will make a neighboring passenger uncomfortable, prevention of noise that would be annoying to others, or of whispered conversation during a sermon or public lecture, the giving up of a seat in a street car, refusal to strike back at a petty or unworthy opponent, the forgiving of a debt to one who cannot afford to pay by one who does not need to take, the payment of a father's debts by a son on whom there is no legal claim, equal taxation, equal suffrage, and equal opportunity to prove innocence of crime. The number of primary relationships thus associated directly with the central idea itself, and of consequent relationships indirectly associated through each, is limited by the time available for memorizing on the one hand and by their relative usefulness on the other.

As associations multiply, their recollection is made more probable and the dominance of the primary relationship greatly furthered, if the secondary associations represent not only useful relationships, but those that are sufficiently similar in form or kind with many others to suggest an association otherwise not readily apparent. The firm association with the equal rights of citizenship of equal opportunity to prove innocence of crime makes it easier to associate with it, lynch law, habeas corpus, trial by jury, and the "unwritten law." Later the importance of such fixed typical relationships to general discipline will be fully demonstrated. Through them varying apperception not only makes it possible for a habit or a definite relationship to be carried to any field of knowledge, but more probable that it will be carried to the field in which it can be usefully applied. Any association may become directly or indirectly useful, but those known to be useful, even though but once repeated in relationship to the central idea, may recall the primary relationships most fundamentally useful, and with each recollection make their dominance more certain. For example, woman suffrage, personal liberty, sumptuary laws, self-defense, the right of search, freedom of worship, eminent domain, prohibition, and federal election laws, associated but once with equal rights, are not only themselves given an increased likelihood of usefulness, but increase the probable usefulness of the ideal with which they have been once connected.

The varying apperception of experience must be supplemented by imaginative work and material in the school to ensure the maximum many-sidedness that is potentially useful. To make it most certainly useful through concentration, its most useful varying relationships must be associated—and the most typical certainly associated with the specific relationships in which the central idea will be most useful.

8. *Specific Discipline, the One Certain Phase of Formal Self-activity, and Essential to the Usefulness of all the Others*

The one form of self-activity which can be certainly made to further the educational aim in all of its phases and details is specific discipline. By specific discipline I do not mean merely the discipline peculiar to some particular branch of study, but the self-activity which is based upon habit in the broad sense of a fixed and specific stimulus invariably calling to mind a particular fact or activity. It not only involves the operation of isolated habits, but of fixed *systems of thought and experience*, in which habit has been associated with habit and general ideas with those subordinate to them. It is the mechanical factor in education. In the case of miscellaneous apperception, an idea may suggest any one of a number of related facts or activities. In the case of specific discipline, whose distinguishing characteristics are definiteness of relationship and the certainty to which definiteness is a necessary condition, a particular fact or activity is sure to follow.

**Specific discipline includes single habits and systems of thought and experience.**

In ordinary individual experience, or experience common to a particular environment or occupation, presentations tend to repeat themselves in definite relationships. These, re-enforced by varying apperception which, however many-sided, brings continually to mind one's ordinary concept of the thing apperceived, are made even more certain than formal education can make them, through a persistent repetition that continues long after the period of formal education has ended. The relationships thus made certain are usually the narrow, the partial, and the commonplace. They may be highly useful, but their usefulness is limited to particular locations, occupations, or social groups. Education should seek to make still more certain of remembrance and recall relationships that are broadly and directly useful, and that have as their stimulus what will continue to recall them in many phases of

every-day life after the repetition involved in formal education is no longer possible. Dr. Halleck, in illustrating the operation of apperception, represents a man up a tree as judging the occupation of passers-by from what their comment or actions showed them to understand the tree to be.<sup>36</sup> It was good-morning, Mr. Tanner, to the man interested in the bark; Mr. Carpenter or Mr. Lumberman, to one who estimated its contents in board feet; Mr. Artist, to another who admired the form and color of its foliage, and so on, with poet, gunner, priest, or school boy. The only well-educated man, however, was the man up the tree. His concepts included that of all the others. Apperception in as broad a sense as the highest usefulness of each essential relationship demands, must be made specific and certain by education, as in a narrower way it is incidentally made specific and certain by experience. Specific discipline and varied apperception must supplement each other.

Children can have but partial and *individual* concepts of the great mass of possibly useful things, but the partial concept of these things that are certainly most useful must be selected with a view to its possible useful relationships and be made fixed and certain through formal instruction. Tree, through education, eventually might suggest æsthetic and religious feeling, the usefulness of its different parts, drainage, and conservation. Through the incidental apperception that results from experience, it would sometimes be something to swing on, sometimes something to climb, and usually the thing that occupation or environment happens to make it. Left to ordinary apperception, sugar may suggest the maple tree, fudge, vacuum pan, sugar tongs, the tariff, sugar beet or Cuba, and, on reflection, a various mingling of such associations. With apperception made specific and certain through instruction, it should when used as a general term suggest a great staple with its raw materials, the countries producing them, manner of production, trade, manufacture, and the uses to which the finished products are put, ex-

**Apperception must be specific as well as varying.**

pecially in America. Even the partial concept of any highly useful thing should, so far as possible, begin with the specific memorizing of one or two of its most useful relationships. Through a purely incidental experience, a church becomes a place where sermons are preached, where Sunday-school is held, where there are entertainments at Christmas. Education should make it certainly suggest the reverence becoming God's house, which in childhood begins, if not with Richter's mighty organ and the light of saint illumined windows, at least with the taking off of hats and subdued voices rather than blue tickets or chewing gum on the backs of pews.

**Even partial concepts should begin with essential relationships.**

Usually the partial concept stops far short of specific apperception. Even the one or two associations upon which remembrance is based are indefinite and uncertain. Witness the agitation of the public press when a year or so ago many of the winners of competitive examinations for appointment to West Point were not sure whether Alexandria was in Asia or Africa, or Saratoga in the Civil War or the Revolution. In fact, one of the most serious criticisms made of the new education is the lack of definiteness, which President Sharpless recently illustrated by the Sunday-school boy who when asked, "What was the first thing which St. Peter did after he denied his Lord?" replied with, "He went out in the garden and crowed three times."

In place of the unvarying repetition of definitely associated facts which characterized the old education, there has been too frequently substituted an individual apperception which, whether optional or accidental, leaves the determination of what is to be remembered and the relationships in which it is remembered, to the selective activity of each individual's mental content. When the old education stopped short of specific discipline it was because it sought to fix certainly all ideas in definite relationships and consequently give adequate repetition to but few relations or

**Specific discipline left too largely to individual determination.**

to those that were non-essential. The new education stops short of it when it seeks to certainly fix indefinite relationships for too few ideas or none at all. Apperception is not disciplinary where it merely develops temporary and many-sided self-activity based on varying relationships. Discipline involves habit, and depends for its persistence upon the adequate and unvarying repetitions of fact and activities in definite relationships.

Whatever the object of a particular sort of school work or branch of study, whether it is intended to further directly industrial efficiency, good citizenship, or some other phase of the aim, or to further indirectly all phases of useful activity through academic training and general discipline, specific discipline should result in two distinct ways and involve the development of quite distinct systems of ideas.

First, the new ideas and relationships resulting from study will be apperceived differently by each individual according to his dominant mental content, his past experience, and the ideas that happen to be uppermost in his mind. Whether or not the habits and systems of the school carry over into life, the habitual attitudes of mind of individual life carry over into the school. Since the repetitions of thought and experience make life habits sure, those that are useful must be made to play their part in formal education, through teaching the material of varying apperception in relation to them.

Second, both the new ideas and relationships and the old should be apperceived by all individuals through common habits and systems of thought which instruction has created and compelled. It is the function of specific discipline to make these habits and systems of thought acquired through formal instruction as certain as those acquired through everyday life. It *must* make them certain of operation in the academic field or they are not disciplinary at all. It *may or may not* meet the conditions necessary to their being carried over into other fields of knowledge and experience. Their dominance in any field, however, is primarily dependent upon



their system and their certainty. Habit must be systematically added to habit until constellations of ideas swing in their orbits as unvaryingly as the planets rotate about the sun.

In the case of the traditional "disciplinary," "abstract," or "formal" branches, such as the languages and mathematics, system and certainty are not only essential to their mastery as wholes, but are favored by the very sparseness of their subject matter, and the necessity for continually and unvaryingly repeating specific relationships and sequences. They have been contrasted with "real" or concrete branches in whose many-sided content system is more variable and the repetition of particular relationships and sequences is not compelled by their unavoidable reiteration.

**The abstract subject compels temporary habit and system.**

It by no means follows that the study of the formal subject is necessary to discipline. Certainty and system are made more probable because specific discipline is necessary to the formal subject. Indeed, the present demand by advocates of formal discipline for concentration upon one or two formal subjects for a term of years constitutes a confession that continuity in the use of subject matter is necessary to certainty of its relationships, even should its abstractness and system compel discipline so long as it *is* in use. A modified course of study may partially ensure this continuity within the school. Outside of it, certainty of academic system is possible only through the continuity of specialization. Certainty of particular habits may be ensured through the continuity resulting from the many-sided relating of the subject matter of the school to every-day experience. Without *permanent certainty* of relationship there is no permanent habit. Without permanent habit there can be no lasting, formal, or general discipline. The side-shows must not distract attention from the main tent. But nothing will be gained by substituting for the merry-go-round of the elective system the hobby-

**Continuity essential to permanent discipline.**

horse of an academic specialization, which will be left behind in school.

To demonstrate, however, that the system and many of the habits resulting from the study of formal subjects are not permanent and continuing for students who do not become specialists, does not deprive mathematics, or the languages, of the aid to specific discipline given by the necessity of repeating its details in unvarying relationships. But the importance of what is after all only a favorable condition can be easily exaggerated. Arithmetic, for example, is not commonly so taught in the schools as to rise to the dignity of mathematical system. The method peculiar to the formal subject compels a certain amount of discipline, but pedagogical method is necessary to ensure it in its fulness.

Every step toward the development of effective pedagogical method in the teaching of the various branches in general

**Pedagogical method can ensure system within any subject.** is a step toward the equalization of conditions inherent in subject matter favorable or unfavorable to specific discipline. The repetitions of history are proverbial, but in it and other many-sided branches, such use of specific relationships and conditions that continually recur, as to make

pupils remember by them and think with them, is not compelled by a method peculiar to the branch itself. It is dependent on a pedagogical method that the teacher too often has not mastered and for which he substitutes outlines, topics, and associations too numerous to be memorized with certainty, which confuse the mind through their number and block the way to general discipline. In the present state of pedagogical training—not much different today in college and university than when President Butler voiced his distrust of the “experience that stands alone”<sup>37</sup>—from the standpoint of certainty as distinct from continuity and other conditions yet to be discussed, the advantage still lies, though quite unnecessarily, with the “formal disciplines.”

The unforgivable sin pedagogical is that on the strength of the minor and temporary aid to specific discipline which the continual repetition of ideas in unvarying relationships gives to the formal subjects, they have become the required subjects of the school curriculum in place of the equally specific systems of thought directly necessary to citizenship, right living, health, industrial efficiency, social service, and the proper enjoyment of leisure. There is not a phase of the educational aim which in addition to all that general discipline, information, and culture can contribute does not require a more cumulative and complex system of specific relationships and fixed habits than mathematics or a language. The direct teaching of good health and good citizenship demands a more adequate specific discipline than the mastery of civics or physiology. The reason why history and civil government have been taught without making good citizens, and physiology without resulting in healthful men and women, is mainly because we have been teaching history, civil government, and physiology instead of good health and citizenship. They too are sciences. To impression and many-sidedness must be added the certain interrelation and subordination of group after group of ideas and activities. The duty of suffrage, for example, must be permanently associated with the noting of registration day and the dates of primaries and elections, the study of men and of issues, the habit of overcoming all obstacles that stand in the way of registration and of voting. It, in turn, with Australian ballot system, the inexorable punishment of frauds at the polls, the Fourteenth Amendment, naturalization, woman suffrage—each one of which like it, and many more has a mass of subordinate associations in its train—must be certainly related to equal suffrage. Equal suffrage must call to mind equal taxation, equality before the law, equal responsibility for its enforcement, with their several series of subordinate groupings and subgroupings, and together with them and other ideas fundamental to democracy be classified as equal

**Direct preparation for life demands greater system than the "formal" subjects.**

rights. Through equal rights the whole complicated body of thoughts and activities of which all these are but a part must be firmly connected with the divisions and subdivisions similarly subordinate to the obedience to law, love of liberty, patriotic self-sacrifice, loyalty to the union, and other fundamental phases of true American citizenship. If the religion and morality, health, political and social service, industrial efficiency, and avocation developed through instruction are to cope with physical, social, industrial, and political evil made certain by experience and systematic through life itself, their specific discipline must be more certain and systematic than that of the "formal disciplines" themselves.

Whatever the human will may be theologically and psychologically, educationally the first step in its development is the building up of specific relationships. It is impression with its specific centering of the feelings that constitutes conscience and "good will" so far as they can be regarded as pedagogical creations. It and the force of specific discipline, the habitual range of ideas within individual systems of thought, form both the negative power of conscience or inhibition, and the positive incentives to routine existence, imitation, and general discipline. It is they that not only make the mathematician a mathematician, the soldier a soldier, and the good man a good man, but the "bromide" a "bromide," the poet a poet, and the inventor an inventor. The "bromide" or "philistine," satisfied with his petty routine, seeing things as he has always seen them, doing what he has ever done, and saying what others have said, whether he is mathematician, soldier, good man, or all three, is one in whom apperception as a solely centripetal force has become certain and continuing. All conflicting associations, all relationships which lead away from the accustomed paths are inhibited by the fixed feelings or idea sequences that reign supreme. Once put the will to sleep or break down its inhibitory force, and the many-sidedness of relationship which has been centered upon fixed circles of thought becomes centrifugal in a reaction

Confined  
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which hurries the mind to associations that, whether useful, evil, fantastic, or absurd, have the one quality in common of being different from the old. One glass of champagne and the bashful or cautious man of few words may give a brilliant and witty after-dinner speech or become a loquacious fool. The bishop is quite likely to swear in the delirium of fever; the unimaginative man to dream of elephants that climb trees. Now the individual who has been so specifically disciplined in some one field that its feelings and habits dominate all others, except when the will is temporarily conquered, is more of a monomaniac than if he had been obsessed by one idea. The monomaniac of one idea is only a monomaniac part of the time; the monomaniac who is dominated by a system of feelings and ideas is never likely to be sane at all. He may play a necessary part in civilization. He may be a mighty conqueror, the remorseless captain of industry, or a glorious fanatic who blesses a people or destroys a creed. But such a monomaniac is the product of heredity and environment or the gift of God. Were it possible to produce him through education, we would not dare for fear that assuming the function of nature and of deity, we would create a Frankenstein.

So far as instruction can supplement nature and experience by completing or correcting the systems which they so specifically and certainly develop, it will be first by building up not one but all of the several great systems of specifically related feelings and thoughts which correspond to the several phases of the educational ideal, including a subordinate academic specialization; and second, by ensuring for each a many-sidedness through apperception and general discipline, that is as essential to their highest usefulness as is specific discipline to the useful concentration of varying apperception.

Useful subordination of all systems to direct preparation essential.

Specific discipline, through and for morality, religion, health, work, social service, citizenship, and avocation, is primary. It can be brought about only through continual

repetition and reiteration year by year of ideas and activities definitely associated in the relationships which make them directly and certainly useful and in which they will continue to be useful in every-day life, as well as in school. For this continuity is as essential as certainty. Not only must habits be continuing, but they must be continuing in the relationships which ensure their direct usefulness.

Obviously, the direct and general usefulness of an academic subject or "formal discipline" is limited to its contribution of various relationships, which will be reorganized in specific association with some phase of the educational aim. Its mastery as a systematic whole is only justifiable for all individuals in common, if it thereby develops some relationship or series of activities, highly useful to all, that cannot be developed as thoroughly or at all by other subjects whose closer relationships to life make useful application either certain or more probable. That is, even from the standpoint of specific discipline, the highly organized subject matter of the formal subject, with its certainty of specific relationships and system, is a disadvantage rather than an advantage if its mastery as a whole is not directly useful. If mastery of the whole is unavoidable as a necessary condition to that of some part which gives a relationship otherwise unattainable, or so much more thoroughly developed that the time spent in the mastery of the whole is justified, the more exact and thorough the branch as a whole, the greater the waste of time in its mastery. Hence, from the standpoint of a general education required of all, as distinct from a specialization possible to each, every "formal" subject is on the defensive—first, to prove that the specific relationship it develops cannot be developed at all or as thoroughly by subject-matter organized for direct usefulness; and, second, to prove that to ensure such mastery or its directly useful relationships, it must be studied as a whole.

From the standpoint of specialization, however, the mastery of the branch as a whole may become necessary—not as a

required subject for all individuals in common, but in order that particular individuals may directly and specifically serve various phases of the aim in some way to which the branch as a whole is essential. All men to be healthy need not be mathematicians and physiologists, but the physician must know his anatomy, and the specialist in advanced medical research his mathematics and electro-chemistry. Sharp discrimination, then, must be made between the specific discipline which is specifically useful to all individuals, and that which is specifically useful to the specialist. Science and civilization demand only of the few, the teachers and investigators, that, for the sake of knowledge alone, they shall devote their life-effort—their continual study to some particular branch of knowledge which to others may be avocation, industry, or citizenship, but to them means the advancement, the conservation, and the transmission of learning.

The specific discipline that directly and certainly makes for the various phases of the educational aim, must not only utilize and reorganize the system that may have been in part academically acquired, but it must utilize and reorganize the specific disciplines of life itself. Conspicuous among these is imitation—especially imitation of a personal example. Ernest gained from the Great Stone Face a lesson which no mere mass of rock could give. The contemplation of Buddha, and “the putting on” of Christ as advocated by St. Paul and attempted by Thomas à Kempis, add through the presence of personality, the repetition of feeling and of action to that of idea, and so bring about interaction of habit and ideal. The imitation of ordinary life, however, needs direction through instruction, and the addition of other forms of specific discipline to ensure its usefulness. No human example is perfect, no divine example will remain unimpaired by the human imperfections which humanity has ever seen reflected in the divine. The personal example of a great teacher impresses itself upon the few; each of the Spheres of Helmholtz responds to but a single

The specific discipline of direct preparation must include that of life itself.

note. It is, after all, the sufficiently persistent pointing out of a great example by teachers who are not great that, added to all other forms of specific discipline, tends most strongly to ensure the ideals and the habits necessary to each phase of the educational aim. Example is better than precept, but it is still better when precept and fixed sequence of feelings and ideas are added to it.

The specific discipline, then, of instruction directly preparatory to each phase of the aim, must be strong enough not only to continue in life, but to reorganize and dominate the specific disciplines of experience. To this continuance and domination the closest possible interconnection between the school and every-day life is an indispensable condition. The specific discipline of the formal subjects most remote from life may be exceptionally certain on account of their remoteness. They are continuing and dominating, however, only for pedant or specialist; and then usually in the negative sense of inhibiting other relationships. Witness Fenimore Cooper's naturalist among the pioneers in "The Prairie," or the professor of the modern newspaper cartoonist, provokingly untrustworthy in life's simplest experiences. Even systems of instruction not merely formal, but directly and specifically disciplinary in health or citizenship, always tend to be limited to the relationships in which their usefulness has become habitual. Specific discipline is negative and inhibitory because it is specific. It tends to prevent wrong activity alternative to useful habits already formed, but not to carry useful habits over into new fields. The carrying over of academic systems as systems is reserved for the specialist, except in so far as an academic system has in whole or in part been associated with the system specifically furthering some phase of the aim. If the habit of systematically noting details developed in chemistry, or a habit of analysis formed in grammar, is to be carried over into industry, it must be specifically associated with some definite phase of industry.

**Instruction to reorganize experience must be related to life.**

The systems essential to morality, citizenship, and the



other specific disciplines directly necessary to complete living, must be carried over as wholes into every-day experience not only to inhibit conflicting habits, but to reorganize and dominate every phase and episode of life in which they can be applied. The sole means to this end are varying apperception and general discipline.

The varying apperception of each specifically useful group in all useful relationships that can be anticipated, is impossible through instruction. Still more out of the question is the anticipatory association of each in all useful relationships that are possible, for few useful relationships are determinable in advance of the situation in which they are needed. At best, as has been said under varying apperception, instruction must present as many specifically useful associations as time permits, and make certain the few that are most typical. Joseph Payne early pointed out the two fallacies of insisting that because there is so much to know in the world children should learn it all at school, and that because there is so much to be done in the world children should anticipate it all through instruction.<sup>38</sup> His solution was formal discipline; Herbart's was many-sidedness. Strange that we have been so long in perceiving that each solution is partial and inadequate without the other. Many-sidedness furnishes the system of transportation and intercommunication by which an idea or relationship can be associated with any other that is capable of recall. It makes equally possible the most desperate freaks of insanity and the noblest flights of imagination. Varying apperception of a useful relationship in manifold useful connections makes its usefulness more probable, both by multiplying the paths of certainly useful recall and by increasing the likelihood of recall. Its specific association in a few typically useful relationships, gives it the only usefulness that is certain, and makes easier the task of general discipline. It remains for general discipline to give the highest probability of application to any useful sequence or habit, and consequently to the whole

**Domination possible only through varying apperception and general discipline.**

system of ideas and activities of which it forms a part, in case that, through many-sidedness, its accustomed stimulus is associated with some unaccustomed field of experience.

If specific discipline is to result in general discipline, if a habit or a sequence is to be carried over into some other environment than that in which it is formed, it must not only be certain and continuing, but its stimulus must be general enough to be found in the other environment. The fact that it is found there does not, of course, make it useful there, nor does its possible usefulness there ensure its recognition and the consequent and certain operation of the habit. The conditions necessary to its recognition will be discussed under general discipline. Meanwhile it is clear that specific discipline must meet the fundamental obstacles to the operation or the usefulness of general discipline—the association in the sequence or habit of a stimulus too particular or too general to be useful.

The too narrow stimulus is well illustrated by the mythical but classical case of the woman who having broken her right leg was sympathetic with all similarly afflicted, but wholly incapable of sympathizing with anyone who had broken the left.

A boy may learn to be certainly obedient to his father and not his mother, to a particular inflection or stress of voice, to a particular teacher, to any teacher on the second floor, or to no teacher off the school grounds. He is not as usefully disciplined as he should be until the stimulus to obedience is a command that does not violate conscience, given by any one who has the right to give it. On the other hand, the habitual stimulus to an idea or other activity should not be as general as possible, but only as general as may be useful. The whole German Empire laughed because a little town obeyed the absurd commands of an adventurer who assumed imperial authority with a cast-off uniform. Useful as the habit of observation is, its stimulus should not be any object which happens to fall within the range of the senses. The amiable lecturer before teachers' assemblies, who proves his

auditors poor observers by asking them the color of the necktie he wore the day before, the number of houses in the neighborhood which have front porches, or on which pair of legs a cow first rises from the ground would be a monomaniac more hopeless because scientific if he carried that sort of observation very far beyond the institute platform. Imagine him noticing the color of each auditor's eyes, the style and number of buttons within his range of vision and the details in the pictures, or other decorations on the wall. One of the most important problems connected with the development of self-activity is the determination of the extent to which it is useful for the stimulus to a useful habit to be general, if the habit is to be most useful. Generalization of the stimulus to a habit, thus limited, is the first necessary condition to general discipline or application, and will be more fully discussed in relation to it. It is the stimulus to the habit, not the habit, that is generalized. Habit is always specific. There is no such thing as a general habit, except as the term is loosely applied to a habit with a general stimulus. The important fact to note at this point is the necessity from the standpoint of education in contrast with incidental experience, of limiting generalization, Herbartian or otherwise, to the useful and to what furthers some phase of the educational aim. Just as modern education has too often concerned itself with the development of mere many-sidedness, without regard to specifically useful apperception, it has insisted upon generalization without regard to the degree of generalization that is useful for the stimulus to a habit which may be either too narrowly or too generally applied.

**Extent of  
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mined by  
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useful  
application.**

This is especially unfortunate at a time when Herbartianism, re-enforcing the movement toward many-sided knowledge as opposed to "general discipline," is emphasizing the importance of the specific discipline peculiar to each branch of knowledge. If general discipline in the old sense is not to be depended upon, it is folly to substitute for it specific stimuli which may be too narrow or too general in their occurrence,

and, as regards the application of the consequent habit, to assume with Mr. Spencer the adequacy of incidental discipline not made certain and useful through method.<sup>39</sup> Payne's warning against the two fallacies, more or less popularized by the new education, is not untimely.

The final factor that must be considered in connection with specific discipline as a condition to general discipline, as it has already been considered in connection with

**Continuity as essential to general as to specific discipline.** specific discipline as an end in itself, is its likelihood or certainty of persistence after the period of formal instruction has ended. While a habit once formed tends to persist, it will not continue to operate with certainty unless it continues to be called into operation. It is, therefore, not enough that effective instruction should ensure the persistence of useful habits throughout the school course, but it becomes necessary either that the branch of knowledge responsible for the otherwise temporary discipline should continue to be studied or that the stimuli to the habits should continually recur in every-day life and be continually identified by the individual, who has been the subject of the discipline. In the case of a general stimulus this recurrence, carrying with it the possibility of the continual operation of the habit, is more likely, though by no means certain. A stimulus may be generally useful without being frequently useful.

The greatest certainty of frequency results from adequate *regularity* of recurrence. This is why the Church seeks to associate firmly acts of religious devotion with certain hours or events of the day. Once so associated, they are as certain to occur as the sun is to rise and set.

It is remarkable that in a scientific age, with educational discussion so closely focused upon the question of discipline, the bearing of the persistency or non-persistency of habit upon the ultimate disciplinary value of the so-called disciplinary branches has not been taken into account. From the standpoint of immediate and temporary specific discipline, the dis-

**Continuity lacking in the "formal" subject.**

disciplinary possibilities of the abstract subject are strong, both from the general form of its stimuli and the continual recurrence resulting from their general form and relative fewness. Its discipline, however, is likely to be only immediate and temporary except in the case of the specialist. To the general student, for example, the value of mathematical discipline declines as soon as he ceases to come into occasional and fairly frequent contact with the combinations of symbols or lines and angles which constitute the stimuli to the great mass of mathematical judgments. Occasional and accidental contact with their stimuli may serve to revive habits, but certain contact with a frequency whose exact determination is an important problem of educational method, is necessary to their persistence and automatic operation. Even the few moral or intellectual habits made temporarily certain by mathematics within the mathematical field, either may fail through inadequate method to have a general stimulus and other conditions soon to be discussed as necessary to general application, or may be formed far more economically than in connection with a multitude of purely mathematical habits requiring in the aggregate an immense amount of time for their development and temporary retention.

To sum up—specific discipline as involving the development of complex systems of habit is primarily essential to the direct furtherance of each phase of the educational aim, including properly subordinated and specifically related academic systems in parts or as wholes, such as civil government as related to citizenship and various operations of arithmetic as related to business practice. Of these directly useful systems, every generally useful moral or intellectual habit should ultimately form a dominant part. It may be first developed in the home or in the school, through conduct or through academic study, but it is capable of being developed through direct preparation alone. Each academic subject essential to direct preparation or to specialization, should make every generally useful habit sure, but it is not always practicable in the academic field to give a generally useful

habit, the general stimulus necessary to general discipline. System as a whole does not carry over beyond the special field. Hence, the more difficult the system is to master and the more adequate its specific discipline, the less likely is its mastery to be essential on the ground of general discipline alone. Any habit that is useful in various fields of experience is capable of being effectively developed in various fields of experience.

From this point of view, a particular branch of mathematics or a particular language or natural science, cannot be justifiably required of all. As a whole, through certain of its constituent habits, it may furnish general discipline to the specialist. Through some of its directly useful parts it may become a general discipline to all. But no one should be required to master it as a whole or in part only for the sake of some generally useful habits which it certainly develops. Even though regardless of pedagogic method it develops them more certainly than any other branch of study, they can be as certainly formed with the aid of effective pedagogical method through direct preparation for life. More than this, if academic organization were necessary to the development of generally useful habits, direct preparation includes enough academic subjects as wholes or in parts to ensure it.

As involving the development of single habits or groups of habits, specific discipline is essential to the certain usefulness and increases the probability of the indirect and general usefulness of each other fundamental form of educational self-activity.

Impression is certainly useful only when its feelings are specifically centered upon a common idea or group of ideas, and more likely to be incidentally developed when instruction has certainly associated with the common center a few incidents which will make it emotional. Mere remembrance is most likely to be useful if the

**No required subjects for the sake of general discipline alone.**

**Specific discipline essential to the usefulness of all other formal self-activity.**

partial concept which holds the thought in mind is one determined by instruction and specifically related to some phase of the educational aim.

Apperception is certainly useful within a limited sphere and more likely to be useful in all of its many-sidedness, if the few relationships in which a highly useful idea is most useful are specifically associated with it. And the operation and the usefulness of even general discipline itself will be found on analysis to depend not only upon the certainty and the continuity of the specific relationship which is to be generally applied, but upon other fixed relationships, in the absence of which the habit most many-sided in its potential usefulness has little likelihood of being carried over.

A realization of the fundamental necessity of specific discipline carries with it renewed appreciation of the fundamental necessity of mechanical memorizing. It does not justify mechanical memorizing *per se*, but the mechanical memorizing of essential relationships. It does not involve reaction into the age of Squeers and Gadgrind, with its verbatim mastery of text-books, rules, and definitions including a mass of details incapable of aiding memory or compelling thought. It does not involve even a partial revival of the Procrustean curriculum in which individualism was crushed by the remorseless force of formal discipline. But it does make necessary as economical a use as possible of such portion of each school day as can be effectively spent in the mechanical memorizing and recall of the specific relationships which not only in complex systems of thought and other activity directly prepare for useful living, but which give the highest probability of usefulness to the impression, mere remembrance, varying apperception, and general discipline which indirectly further the same end. The determination of the relationships thus essential is one of the most important functions of the science of education, and is tentatively discussed in the following chapter. When physiological and psychological conditions so seriously limit the time that can be effectively spent in

Specific  
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memorizing.

memorizing, when individuals vary so greatly in their native retentiveness, the mastery of non-essential details or of merely formal disciplines is a crime against both the development of individuality and social progress. It is with scientific appreciation of the pedagogical value of the little time available for memorizing and specific discipline that Alexander Bain asserted that the study of the classics in place of training the memory expends it.<sup>40</sup>

*9. General Discipline, the Phase of Formal Self-activity which Ensures the Widest Useful Application for Useful Relationships*

If there were no limit to the anticipation of useful relationships and no limit in time or in physiological conditions to the number of relationships that could be made certain by specific discipline, instruction could, theoretically at least, prepare for every emergency in life without the mediation of general discipline. The teacher would become a prophet; man, an automaton. It is the necessity for the mediation of general discipline and the uncertainty of its useful operation that makes man both a responsible being and a creature of circumstance. On the one hand, its limit lies in varying apperception—the extent of whose many-sidedness of possible relationships narrows or broadens the field in which habits can operate; on the other, in specific discipline—the certainty of whose persistence and the relative abstractness of whose general stimulus lessen or increase the number of habits which can be carried over.

Joseph Payne and Herbart were equally conscious of the inadequacy of specific discipline. But Joseph Payne sought to supplement it by formal discipline which, emphasizing the specific discipline of an academic subject and ignoring many-sidedness, except in so far as the Latin language ensured it, took universal application for granted. While Herbart sought to supplement it through many-sidedness and in his five formal steps to ensure general application not only without the specific discipline of an academic subject, but



without making clear or perhaps clearly perceiving that his circles of thought must in themselves become specific disciplines or center about them. Certain of his followers have come to emphasize the importance of the specific discipline peculiar to any branch of knowledge and, consequently, specialization. They have as yet failed at two points. First, in failing to perceive the fundamental necessity of specific discipline through direct preparation for life, that is, of specific discipline based on cumulative organization and systematization of material in relationships which directly further each general phase of the educational aim. Second, in failing to realize the fact that the general discipline whose importance they minimize is involved in the general application of specific habits even within the field of the academic specialty which develops it. That is, "specific discipline," in the sense in which Professor De Garmo uses the term,<sup>41</sup> is impossible without general discipline

**The "specific discipline" of a special branch involves general discipline.**

of precisely the same sort that is necessary to carry over a habit into some field into which the whole system of which it is a part cannot be carried. It is little less difficult, for example, after a mathematical proposition has been demonstrated and its premises and conclusions habitually associated with each other, to apply it within the mathematical field itself—say to originals in geometry—than to apply other habits quite outside of the field of knowledge in which they are formed. This means that the scope of general discipline is broad enough to include specific discipline in any other sense than the formation of a particular habit. Greater dissimilarities and complexities may stand in the way of the application of a particular habit within a branch than of the outside application of another formed in the same field. The true general discipline is the carrying over of a habit to any environment in which it is more difficult to recognize its stimulus than that in which it was formed.

It is the habit that is specific and its application that is general. The Herbartians come nearer to the true problem

when they investigate specific and useful apperception, which culminates through generalization in application. If they had been as persistent in investigating "application" as "presentation" and "preparation," the problem might have already been solved.

There is little choice between an academic cocksureness, which assumes general discipline as a matter of course, and a pedagogical skepticism, which has been trying to ignore it altogether. In either case it continues to operate incidentally without the assistance of a scientific method which will ensure for it the broadest operation that is useful.

No experimentation is necessary to demonstrate that it does operate incidentally. What experimentation has demonstrated is that it does not operate as a matter of course. Even its incidental exercise, aside from the effects of variations in experience and instruction, varies greatly with individuals in proportion to their native retentiveness, their physiological capability of readily multiplying associations, their sense of discrimination and ability to identify. But that it *is* exercised every individual can discover for himself, either through noting his every-day experience or from a glance at the history of human thought. Investigators, having formed the habits of thought peculiar to physics, carried them over into psychology and psychophysics, a new science, was born. Every great invention, almost every apperception of a new idea, and many an application of ideas that are old involve the carrying over of some fixed relationship into a new environment. In many of us general discipline operates within restricted and familiar fields, in the most of us it operates far too little.

**Experimentation  
proves  
general  
discipline  
uncertain.**

## CHAPTER III

### A DISCUSSION OF THE CONDITIONS FAVORABLE TO GENERAL DISCIPLINE

GRANTED a habit or sequence of ideas certainly formed and persistently recalled, with a stimulus as general as is useful—and the fundamental problem of general discipline is (1) To what extent can it be carried over into other fields of knowledge and experience? (2) To what extent will it be useful to carry it over? and (3) what are the conditions which must be present to make its useful application as probable as possible?<sup>42</sup>

**The fundamental problem of general discipline.**

#### 1. *Extent of General Discipline Dependent Upon Recurrence of the General Stimulus*

Obviously, the extent to which a fixed relationship can carry over into other fields of knowledge and experience than the one in which it is developed, is dependent upon whether or not the usual stimulus is to be found there, and whether or not the usual consequence or a modified consequence can follow. In the first place, no system of thought as a whole can carry over, though component habits or groups of habits can. The various systems of habits on which the specific discipline of mathematics is based can apply only in the mathematical field. They can become general within that field and apply to physics, chemistry, or engineering, but their application is always mathematical. This is equally true of every other complex system of ideas and activities. Systems are specific—not general—in their usefulness. Mathematics cannot take the place of geography; or geography, of citizenship or industrial efficiency. One system

**Academic systems cannot carry over as wholes.**

may include another or require another to supplement it. One or more mathematical systems are required by each of the sciences and by many branches of industry. Industry in most of its forms requires sciences as wholes or in parts, as well as a system of ideas and activities directly preparatory to all forms of industry. But the systems do not carry over to other systems because they are specific in their organization.

On the other hand, their component habits and groups of habits may or may not be capable of carrying over. The habitual mathematical judgments suggested by combinations of lines or symbols cannot, because in such connection they are found only in the mathematical field. Often they cannot carry over even from one branch of mathematics to another. The habits of algebra operate but little in geometry, or those of geometry, in trigonometry. In the case of the languages, however, certain relationships very commonly find their stimulus in all languages, depending in each upon the extent to which the forms of language have been developed. But they cannot operate in fields other than the languages because their stimulus or consequence does not occur. The relationship is not there.

Even habits which have a sufficiently general stimulus to be carried over are not necessarily connected with that general stimulus in the mind of the mass of learners. Observation, analysis, synthesis—immediate or progressive—discrimination, identification, industry, and persistency *can* have as their stimulus any group of things, but since such a stimulus would be too general, are actually stimulated by particular kinds of things. It follows that the very “thoroughness” of a formal discipline tends toward the specific rather than the general. It makes a specific system sure, but system cannot be carried over. It makes symbols, lines, and grammatical ideas highly certain stimuli, but the more certain it makes them the more surely the resulting habits are combined in the system, the more difficult it may be to associate resulting activities with some other specific stimulus.

When the useful general stimulus is not so general in its form as to prevent its being actually substituted for the specific one which is being made certain, some of the virtue of "thoroughness" may be handed over. The boy who is habitually obedient to a particular individual, or the soldier to a military superior, can be drilled into associating with specific or soldierly obedience, obedience to any one having the right to command, rather than with a particular tone of voice or a uniform. Even here, unless the stimulus is to be a mere command, typical stimuli such as parent, teacher, policeman, ship officer, etc., must be in turn associated with the general stimulus, not to make it more general, but to make it general in a particular field where its exercise is useful. Even obedience to God's law must be associated with "children obey your parents," "servants, your masters," and the idea of obedience to law.

But where, as in the case of formal discipline or, indeed, of that of a natural science, the only general stimulus alternative to the specific one is too general to be useful or profitable, carrying over is impossible except through the association of other specific and, where possible, typical stimuli with the original one itself, combined with sufficient practice in carrying over to prevent the negative effect of not obeying the stimulus. One cannot observe everything, synthesize all details, or be industrious in every field of experience. More than this, where a particular field of knowledge is so general in its extent in time or space, as to be continually presenting its details, its specific stimuli may be so all-pervasive as to shut out or at least tend to prevent observation, synthesis, or industry in any other field. The thorough botanist is less likely to observe rocks and birds on account of his habit of observing flowers. Sir Isaac Newton boiled his egg-shaped watch while holding an egg in his hand, took off his hat to a cow, and fell into a ditch, not because he was a poor observer, but because he was an observer of the stars. At times, when the habit, through the

**General discipline sometimes possible only through multiplying specific stimuli.**

thoroughness of its exercise in one field of experience, is not of necessity excluded in all others, it can be carried over into other fields specifically and continually associated with the general stimulus. A thorough observer in chemistry can be readily led to observe in physics or in the affairs connected with some ordinary business if, as he observes in his chemistry the idea of observing in the other field is made habitual, unless, notwithstanding his thought of observing, continually confronted with the other field, he habitually fails to observe. That is, while he need not be drilled on observation in the newer fields until they themselves become specific disciplines, he must be drilled in carrying the thorough habit over.

It clearly follows, first, that, altogether aside from the argument, based upon the necessity for continuity of the habit, which is to be carried over, the field of study in which a particular habit, general in its usefulness, should be formed and consequently made certain, is the one in which it will continue to be most useful; and second, that its general stimulus should be continually associated with other, and, so far as can be, typical fields in which it ought to operate most frequently. This means that except in the case of specialization, habits generally useful should be formed through direct preparation for some phase of life. No subject should be required of all students on account of its disciplinary value alone, no matter how certain the specific discipline that it compels or how numerous its generally useful habits that can be carried over into other fields of experience.

## 2. *Necessity for Determining the Extent to Which It Is Useful to Carry a Habit Over*

The importance of determining the extent to which it is useful to carry a habit over has been abundantly demonstrated in the preceding discussion. Not all general discipline is useful. The habit with a general stimulus may be incidentally carried over, when the individual forming the habit

is not conscious that it is general. If the trained observer, for example, becomes interested in some new field, we may, so far as is permitted by conditions yet to be discussed, apply the habit of observation, already formed, usefully or harmfully, as may happen to be the case. It is the province of instruction to see that as the habit is formed its stimulus is made as general as may be useful. This, as has just been indicated, can be done in two ways: First, in cases where there is no alternative except between the stimulus specific in the field in which the habit is formed and one so general that it can carry over into fields where it will not be useful, it must be continually associated in actual practice with other fields in which it ought to operate. It may carry too far. It may scarcely carry at all. But it will be most likely to carry to the fields to which it has more or less frequently been applied. Of course, if it is applied often enough in any one of them to actually become habitual, a new specific discipline will have resulted.

Second, in cases where it can be put in the relatively more general form in which it is most useful, the specific discipline itself should constitute a continual application of the more general stimulus, which thereby becomes potentially and usefully specific in a far wider field. If, for example, obedience, like observation, could be made generally useful only by associating it with obedience in school, obedience to parents, obedience to law, and so on, it would be less likely to carry over usefully than when the more general stimulus of any command from one who has the right to exact obedience is continually associated with each habitual stimulus. The first sort of limitation merely multiplies specific fields of usefulness; the second ensures a field of application far wider than the specific fields can collectively be.

### *3. Continuity the First Condition to General Discipline*

Certain of the conditions essential to general discipline have already been discussed: First, continuity of specific discipline. Since the system peculiar to a particular branch as a

whole does not carry over, it is apparent that unless it is in itself directly useful it is not essential that it should continue as a whole. It is essential only that any constituent habits or groups of habits that are generally useful should continue and carry over. If they are generally useful, it follows as a matter of course that they *can* be developed outside of a special branch, and hence in case the general branch is not directly useful that they *should* be developed outside of it. The reasons for this are clear. It is wasteful to study the special branch if its only use is the mastery of specific relationships which can be developed elsewhere—the more thorough and certain the specific discipline as a whole, the greater the waste, both in point of time necessary for the thoroughness and in the tendency for the useful specific relationships to suggest the useless system in place of systems in which they are themselves directly useful. Since the special branch that is not directly useful even as avocation or through specialization is likely to lose its continuity, its useful relationships must be made habitual in some other field of knowledge or experience before they are forgotten with the rest of the branch as a whole. It is easier to develop them in the first place as part of a system in which they can continue, and easier to continue them in the system in which they are first developed. More than this, in the case of the formal or abstract subject, the only habits that *can* carry over are those, such as observation, analysis, synthesis, perseverance, and industry, which, owing to the fact that their most general stimuli—the only alternatives to the specific stimuli peculiar to the abstract branch—cannot be usefully substituted for them, must after all be developed by persistent exercise in each field in which they are useful to the individual. They will be more readily developed in any field because they have already been developed in some one, but why not in one in which they will continue to be useful, or at least in one which is directly useful while it lasts? A boy coming into the city from the country to go into business

Continuity  
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direct prep-  
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would be better equipped for his work if he had been trained to remorseless industry and routine in it, rather than in the work of the farm. He might have been as adequately drilled to work and to persevere through the study of the higher mathematics or Sanskrit, undertaken on account of their remoteness from his life, but while he has been at work on the farm he has been of use in the world and has added to his habits of labor a consciousness of the necessity of work, as immediately useful in itself, under conditions more nearly identical with work in general, than are those involved in abstract study.

The multitude of fixed relationships involved in abstract study die with it because they are incapable of being related to life. In any specific discipline, whether of life or of study, the only chance for continuity on the part of habits with stimuli which, like those to industry and analysis, have no other alternatives than being variously specific or becoming too general, lies in their fullest useful relationship to other fields of knowledge and experience which are to continue as a part of every-day life.

The foregoing arguments are in themselves overwhelmingly conclusive against the required study of subjects useful for their general disciplinary value alone, but others will be added which are in themselves strong enough to be convincing.

#### 4. *The Second Condition to General Discipline, Habitual Consciousness of as General a Stimulus as Is Useful*

The second condition to general discipline is as general a stimulus as is useful, of whose general meaning the individual forming the habit is made habitually conscious by effective pedagogic method. The specific discipline may provide a sufficiently general stimulus, but only effective pedagogical method will make the learner conscious of it. For example, the fundamental principles of percentage are so general in their form as to be universal in their application. Anything can be conceived of in terms of hundreds. To the ordinary pupil, however, "base" is as concrete and narrow a term as "cost" or "par value." The term base must be so consciously

and persistently associated with the idea of hundreds on which a certain number of hundredths are to be taken that it is associated not merely as a name, but in its general meaning with per cent., just as percentage, in turn, must come to suggest the number of hundredths taken and the resulting hundredths on all the hundreds. Otherwise, the general principles are not general—even within the arithmetical field.

**Variation in grammatical nomenclature a bar to application.** In the case of other mathematical subjects, such as geometry and algebra, from the standpoint of mechanical operation, the stimulus is general, both in form and meaning. If their relationships are mastered at all, they usually are mastered with both the general form and the general meaning that will make them useful. In the case of the languages, and more especially the grammar of the English language, the general terminology is at many points so hopelessly conflicting that the general meaning of a stimulus has to be associated with as many as six or seven different general terms denoting it. Mr. W. G. McMullin, for example, has shown that in the elementary grammar and language works used in the city of Philadelphia alone, it is possible, though, of course, not probable, for a pupil to have to learn thirty-one names for but seven different constructions.<sup>43</sup>

Here the *final* remedy is selection of some one general term for each general relationship by a national committee sufficiently representative to compel universal acceptance. Largely through the efforts of Professor C. R. Rounds, of the State Normal School at Whitewater, Wisconsin, and of Professor Hale, of the University of Chicago, the National Education Association, in 1911, actually appointed such a committee to confer with similar committees from the American Philological Association and the Modern Languages Association of America, which had made abortive effort in the same direction in 1906.<sup>44</sup> The *immediate* remedy is the requirement that every teacher of grammar shall be familiar with a sufficient number of the terms in use to prevent her from calling a pupil wrong who makes correct use of

some one of them not included in a particular text. To require itinerant pupils to master successively three or four different terms for the same general relationship is confusing in a high degree, and an obstacle even to specific discipline in the sense of general discipline within a particular branch.

In most branches of knowledge or fields of experience there is the added difficulty that the specific discipline, in place of failing to associate a general meaning with a general stimulus, establishes a relationship whose stimulus is concrete, not only in form of expression, but in its inclusiveness as well. Here the method by which the learner is made conscious of the general meaning of the stimulus depends upon whether the stimulus can be made just general enough in form to be useful, or whether there is no alternative between concrete stimuli and one too general to be useful. In the case of obedience there is such an alternative. The stimulus to obedience by which the habit is first formed may be highly concrete—the mother's request twice repeated, the father's order sternly put or the command of a policeman or military superior, but each has as its possible alternative not merely a harmful obedience to any command, but obedience to any order that is not evil given by one who has the right to command the one to whom it is given. In this case, consciousness of the general meaning of the stimulus should be brought about through the persistent *substitution* of the generally useful form for the concrete one, and its equally persistent association with its general meaning.

**The most generally useful stimulus should replace the concrete.**

If this persistent repetition is necessary in the case of a simple general stimulus and its consequences, it is all the more necessary when the general stimulus itself consists of a sequence or group of general ideas. In this case two distinct associations are to be made permanent, that of the parts of the stimulus with each other and that of the stimulus with its consequence. For example, the association of seaport with commerce is as incidental to geography as one of the axioms to geometry. But equally firm and mechanical association

of climate, physiography, natural products, manufactures, and commerce, in general logical sequence with a geographical description of any country, is not so incidental. Most children in a grammar school will follow some such outline as they study each country, and perhaps be questioned by their teacher into making "for themselves" a separate outline for each, without gaining an iota in independent thinking or advancing one step toward general discipline. If in connection with their first lesson on a country as a whole, however, they should mechanically memorize this general sequence in its general form, they would have something which they could be led to remember by and think with as they come to study the description of each new country. This is what the McMurrays and other Herbartians mean

**The essential similarity in type studies must be retained in general form.**

by the "type-study," but the type-study is frequently understood to be merely the selection of a typical thing and the teaching of it in detail. Minneapolis is a type of a manufacturing center, but the detailed study of Minneapolis for several days will not make it so. First from all details related to it must be selected those that are common to most manufacturing centers—accessibility of raw material, cheap means of getting it to the manufacturing center, motive power, cheap means of getting the product to market. Then they should be certainly memorized and retained, in association with each other and with the judgment manufacturing center. Usually, if they are separated out and memorized at all, it is likely to be in the more narrowly useful form of wheat fields of Minnesota and surrounding states, Mississippi River and parallel railroad lines, Falls of St. Anthony, and the Great Lakes. The common sequence is not mastered in the general form which makes it common. This memorizing and retention of general groups of sequences is indispensable to the mastery of any branch of knowledge, and equally indispensable to the realization of the various specific aims included in direct preparation for life. It has been too largely ignored in each.

Finally, whether the relationship is a single relationship or a series of relationships, if the only general stimulus that can be substituted for the specific one with which it is first formed is so general that it may at times be harmful, the sole pedagogical alternative is the addition to it of a number of other concrete and specific stimuli re-enforced, when possible, by *cumulative impression* whose relation to general discipline remains to be discussed. The most useful habits of all, from the standpoint of mental development—observation, industry, synthesis, etc.—would be in part mutually exclusive, if their stimuli were put in the only general form which could be substituted for the particular concrete one peculiar to a particular branch of knowledge or field of experience. The student who becomes a trained observer in the field of chemistry or biology, could through the substitution in the accustomed stimulus to observation, of any sort of details in place of chemical or biological details, become so persistent an observer that he could neither work nor analyze. Indeed, it is from just this point of view that Mr. Bain criticizes drawing as the means to an observation which “clothes the particulars with such a degree of concrete interest that the mind prefers to remain in the concrete.”<sup>45</sup> “Interpreting indications by applying previous knowledge”—the means by which observation contributes to other useful habits—is, as he further points out, “a special training within a limited sphere.” It is the function of instruction to see that habits which thus tend to become too general in their application to be useful should have certainly associated with the stimuli of the spheres in which they are developed those of the spheres in which they will be most useful if they are carried over at all. While this should include the development of these relationships through the specific systems that directly further health, morality, citizenship, industrial efficiency, and other general phases of the educational aim, it is important to note that unlike those of the formal discipline many of the stimuli of the natural sci-

A variety of typical concrete stimuli, the alternative for too general a stimulus.

ences, literature, and history continue to recur in the everyday life of those who are not specialists, and hence that their habits often need not be carried over into life because they are already a part of it.

From the standpoint of relationship, and hence of this entire discussion, the traditional distinction between content and form emphasized by Professor Dewey<sup>46</sup> and recently reaffirmed by Professor Heck<sup>47</sup> is unnecessary. Both content and form are dependent upon a relationship or a set of relationships. In the case of content, the emphasis is upon the resulting organization of the particulars that are in relationship; in that of form, upon the mental activity resulting from the relationship when it is habitual, and has a sufficiently general stimulus for it to be carried over into various fields of knowledge and experience. In either case, whether a general idea is accumulating and subordinating particulars or a general form of activity is being put to varied use, the conditions to application are the same.

5. *The Third Condition to General Discipline, Certain and Permanent Association of the General Stimulus, with Typical Applications*

The third condition to general discipline is certain and permanent association of the most useful general stimuli with a limited number of typical applications.

In "application," the fifth of the five Herbartian formal steps, a relationship with a general stimulus is associated for the time being with such applications as occur to the teacher or the experience of the learners suggests. Its inadequacy is due to the fact that it usually stops short, first, of a repetition and review through which a varying number of the most useful and most typical applications are as firmly as possible associated with the general stimuli that are most useful; second, of a sufficiently many-sided relating of the general stimulus to common and individual experience to serve the purpose of varying apperception; and, third, of

the certain association, wherever possible, of an emotional center that will further cumulative impression. Each of these conditions to general discipline is worthy of separate discussion.

It is not sufficient to determine into what fields a habit can be carried and into what fields it will be useful to carry it, but it must be certainly and permanently associated with a variety of its most essential applications, not only to increase the likelihood of its being carried over to them, but that through both their variety and certainty they may become the nucleus for a constantly growing field of application. Applications that are similar only through the stimulus in its most generally useful form, but in other ways strikingly *dis*-similar to each other, will reveal themselves more readily through their stronger similarity to some one of these fixed applications. To many individuals who think themselves honest and who would cheerfully accept as the general stimulus to honest action realization of the fact that something is neither morally nor legally their own, honesty merely consists in not stealing. If the general stimulus should be firmly and tenaciously associated in their minds with lost property of others which they find, with a railroad or trolley ticket which a conductor has not collected, with money which they morally owe, but are not legally compelled to pay, with a set of ideas which will pass as their original contribution although they have gained them from some old book or distant thinker, they will not only tend to be more honest in the specific cases so associated, but in others similar to each.

Each fixed association with a typical application increases likelihood of general discipline.

6. *The Fourth Condition to General Discipline, the Habit of Seeking Unaccustomed Applications for Each General Stimulus*

The fourth condition to general discipline is the habit of seeking for unaccustomed applications or fields of application for each essential general stimulus.

Each new application may not in itself become certain and habitual. As it does, it passes from the field of general discipline and probable application to that of specifically useful habit. The most that can be done through the indirect furtherance of the aim is to make useful thought and action more probable. "Adaptation" is rarer than application, because in its only certainly useful sense it reverses the process just described. Instead of a general stimulus being made less general but stronger through the addition of conditions peculiar to particular sets of situations, adaptation applies the usual sequences in a situation where the stimulus can be recognized only in the most general form. The lost tourist, confronted with a chasm and with retreat cut off, perishes if the thought of bridge calls to mind only the accustomed swinging structure of vines or ropes. The power of adaptation that saves him is the thought of anything on which he can cross, and hence the felling of a tree, so that it will reach to the other side. This "sagacity" or "flash of recognition," while naturally possessed by some individuals in uncommon degree, should be, so far as possible, developed in all. Students should be required to seek again and again for unaccustomed instances of each essential general stimulus in ordinary experience—especially in fields of experience where the instructor knows that it can be found. But where application is most vital, instruction must not depend upon "the power of adaptation," as, for example, Professor James confessedly did when he presented general psychological truths to teachers,<sup>48</sup> but upon the certainty and persistency of relationships which make application most probable. Adaptation in the sense of risking a modified sequence for a partially identical stimulus properly belongs to the discussion of analysis and synthesis as conditions to general discipline.



7. *The Fifth Condition to General Discipline, Sufficient Emotionalizing of the General Stimulus to Make It a Center of Cumulative Impression.*

The fifth condition to general discipline is, that wherever useful, the general stimulus should be made an emotional center through its certain association with a few illustrations exceptionally strong in the common feeling necessary to cumulative impression, and its continual association with others less likely to be remembered, but certain to re-enforce the common feeling.

Professor Bagley fixes upon the emotional general idea as the chief condition to the carrying over of habits. Professor Heck has pointed out, however, that there are many habits that carry over without emotional force behind them.<sup>49</sup> He might have added from Mr. Bain's viewpoint, that there are habits with whose carrying over emotion might actually interfere—if it did not center upon the stimulus as opposed to various ideas associated with it. A development of interest in the subject-matter of mathematical problems, for example, does not necessarily aid in the application of a general principle that will solve them, and might, where it is strong and immediate, actually distract attention from the stimulus whose identification results in the mathematical judgment. On the other hand, where the vague feeling of ease or pleasure that springs from the ready recollection of a consequence by its stimulus is associated with the stimulus, its cumulative re-enforcement through other pleasurable impressions undoubtedly increases likelihood of application.

But there are phases of life in which emotion plays a larger part, where the application of a habit is finally conditioned by the association of cumulative impression with its general stimulus. A habit whose stimulus is concrete and specific may operate without the added incentive of emotion, but in an emotional environment, where emotions conflict, the *general* stimulus that is most strongly re-enforced by

**Emotion a determining condition to the operation of opposing habits.**

cumulative impression has the greatest likelihood of dominance. That is, emotion is not so much a condition to the carrying over of a habit, as to its operation in opposition to conflicting tendencies or habits.

In incidental experience all sorts of habits gain this re-enforcement from feeling and emotion. Through instruction only these relationships that are most generally and fundamentally useful can become dominant through the force of a common feeling made well-nigh irresistible through cumulative impression. There must be a permanent association of each general stimulus with the fixed ideals, sentiments, beliefs, and impressions which give the individual his point of view and collectively constitute public opinion. To this end, the first step is the association with the general stimulus through repetition and allusion of a selected few of the incidents, experiences, stories, poems, and maxims most emotional through their form of expression, that will result in the common feeling helpful to right application. It is this that old David Fordyce had in mind in his *Dialogues on Education* which, though written almost two centuries ago, still constitutes the keenest analysis of the conditions involved in moral education. "I think," he asserts, "it will be universally allowed that the associations or knots of ideas (if they so call them) which we join together in moral subjects, or those things which constitute our complex notion of happiness, are the cause of our right or wrong taste, the origin of motion to our passions, and consequently to our conduct, and the spring of our happiness or misery in life. It must, therefore, be an affair of the utmost importance in education to settle just associations in the minds of youth, and to break and disunite wrong ones. The doing this aright I take to be the grand art or engine of moral culture. It is in the imagination, as I observed before, or in that middle faculty of the mind between sense and reflection, that those images of beauty and good are formed which sway our resolutions and guide our passions. Truth, unsupported by these or separate from them, makes but a faint impression on our minds.

Thus, let a miser be ever so much convinced that money is only the means of enjoyment, not the end, and that it is only valuable as far as it is useful for attaining that end; I say, let him be convinced of this as much as of the truth of any proposition in Euclid; still the images of his bags and shining metal, with all the annexed ideas of property, enjoyment, security against want, independence, and the like occur which make him fancy a happiness in the mere possession, separate and quite distinct from the use. In vain do you tell him that his happiness is a dream, that he hugs a mere phantom; he blesses himself in the delusion, and thinks your taste vicious, while he approves and acquiesces in his own. It must, therefore, be of the last consequence to have a correct imagination, or, in other words, to unite the images of beauty and good with our perceptions of truth and nature."<sup>50</sup>

The first step toward making useful relationships emotionally dominant is the sure association with their stimulus of a fixed nucleus of these "images of beauty and good," highly emotional in their form of expression, which will tend to "sway our resolutions and guide our passions." It is here that literature and the fine arts perform their noblest service. As the old Greek gained through Homer his ideals of citizenship, his standard of morality, and his reverence for the gods, so the Christian and the citizen of today can best gain his from what is highest and best in the spiritual inheritance of the race that world art and world literature have transmitted in the emotional form most likely to find individual expression in right living and heroic achievement.

The second step toward their dominance is the persistent association with the fixed emotional center of a constantly accumulating mass of illustrations which in their aggregate will re-enforce the common feeling, even though they themselves are forgotten.

The relationships which are directly and usefully related to life alone possess the stimuli which can become strong through emotion. Whether found in science or in experience,

**Literature  
and the  
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form.**

they, rather than grammatical constructions and logical formulas, are the true humanities. Mathematics, the languages, and the sciences can be emotionalized in their motives and incentives only when their relationships are directly useful to all learners, or when they have added to them the ideals of the specialist who makes his living by teaching them, or loves knowledge for the sake of knowledge. The boy or girl who studies them only for the sake of an ultimate general discipline has only the inspiration of work for work's sake, which in the young is an ideal to be developed rather than one that can be put to the sternest strain.

8. *The Sixth Condition to General Discipline, the Association of the General Stimulus, through Varying Apperception, with as Many Other Ideas and Activities as Possible*

The sixth condition to general discipline is association of the general stimulus, through varying apperception, with as many other ideas and activities as possible.

It is through varying apperception that the useful relationship having a general stimulus is provided with the system of intercommunication by which it can pass into any field of experience in which the stimulus can operate. It is through varying apperception that the stimulus may become the center for a useful concentration which both adds to its comprehension and in a highly cumulative way multiplies again and again its likelihood of recall. With this latter phase of its service, which through the growing many-sidedness of its general stimulus makes the relationship an increasingly dominating force, cumulative impression co-operates. Impression, however, if it is to be cumulative, must constantly re-enforce a common feeling. Varying apperception may result in a thousand conflicting feelings which may or may not re-enforce the common one, but which attract the useful relationship in a thousand different directions and make it more potent as it turns toward each. The certain association of a few typical applications with the general stimulus furthers varying apperception; the effort to discover new applications

utilizes it. But the Herbartian apperception and application must unite and become far more many-sided. If the general stimulus is a highly essential one, instruction should associate it not only with as many useful applications as possible, but with all possible ideas which do not check its useful exercise or detract from the common feeling which tends to emotionalize it. Such many-sided association is something more than a condition favorable to useful general discipline. It is a means to culture and, as varying apperception is here limited to a useful general stimulus, it is a means to useful culture.

Unless all of this varying apperception is to sink to the level of impression, it must be kept alive by adequate exercise throughout the entire course of instruction. The continuity necessary to general discipline must be assured. The teaching of honesty, as has been said before, must not be limited to the third grade and truthfulness set aside for the sixth. Maxims, stories, examples, personal recollections, biographical incidents, talks, questions, allusions, poems, pictures, and songs—all associated *with the general stimulus*—tend to ensure the widest usefulness to a relationship. Although the varying apperception which results from them tends to generalization, it does not serve the same purpose to associate them with merely the general idea of honesty, because in the minds of individuals this general idea may limit itself to not stealing. Since it is the idea of not taking or retaining what is not morally one's own that must become many-sided, varying apperception must, from the very beginning, associate other ideas and activities with it, in place of being the means by which it is developed through their association with a narrower stimulus which they gradually broaden. However, the broader and more many-sided one's knowledge and experience, even in the mere sense of information, held in mind by accidental or at least individual and varying relationships, the broader the field of possible application. If, in place of mere information, the details

**The varying apperception must be of the stimulus in the most useful form.**

of knowledge and experience have been from time to time or even at some one time presented in relationship to the general stimulus, the probability of application is immensely increased.

So far the conditions to general discipline that have been discussed bear upon the general stimulus itself. The remaining conditions have to do with the environments in which the general discipline is known to be most useful. Unlike

**The remaining conditions to general discipline bear upon environments in which it may operate.** the foregoing ones, therefore, they increase the probability of the carrying over of a relationship into particular fields without increasing the likelihood of it being carried over into all fields. From the standpoint of the field of application they consequently apply with especial force to general application within the field of a specific discipline, such as a particular branch of mathematics or a natural science. They may embrace

any field, no matter how remote from the one in which the relationship was originally developed, but are little likely to aid application beyond it. From the standpoint of the relationship to be carried over, they especially apply to habits for which the most general possible stimulus would not be useful and yet which have no alternative between it and various specific stimuli. Among such habits the so-called formal relationships are conspicuous—industry, observation, perseverance, and even analysis and synthesis. Relationships whose stimuli can be made as relatively general as may be useful are especially helped by the conditions already discussed.

9. *The Seventh Condition to General Discipline, Certain Association with Each General Stimulus of the Knowledge Necessary to Its Identification and Application in the Most Useful of Its Concrete Forms*

The seventh condition to general discipline is certain association with each general stimulus of the knowledge necessary

to its identification, and application in the most useful of its varying concrete forms.

Inference is the connecting link between many-sidedness and general discipline. Some detail of an idea or an expression suggests a general stimulus in part or as a whole. While many-sided knowledge may exist without leading through inference, analysis, and synthesis to application, general application can not exist without it. Each without the other is relatively useless. The usefulness of knowledge is restricted to incidental and individual "thinking"; the usefulness of the general stimulus, to instances in which it has been adequately applied in some concrete form. If to interest in the application of a general stimulus is added its permanent association with certain fields of knowledge, application within these fields is highly probable. The habitual seeking of instances in every possible field still further increases the likelihood of its being carried over.

But no interest, or habit of seeking out similarities, or natural "sagacity" can bring about identification of a stimulus which is disguised by unfamiliar terminology or experience, or application which requires knowledge as yet unacquired. The first difficulty that a child has with problem work in school is that he does not know whether to add or subtract, because he has not associated the idea of more or less with such common terms as buy, sell, lose, find, give, spend, and so on. Such a series of connecting links as multiplicand, hundreds, base, and cost, between the general stimulus and each of its highly useful concrete forms, must be certainly retained or the habits connected with the latter are no longer applications at all. Such terms as suffrage, ballot, Australian system, polls, and voter's assistant, together with knowledge of facts called for in registration and qualifications required by particular offices, and the fundamental issues of a particular campaign, are necessary before one can apply the habit of casting an intelligent and honest vote. It is the fact that there can be no analysis without knowledge of details that makes the habit of analysis and synthesis, soon to be discussed,

so specific a thing. It has to be formed anew with each new field of application, and is conditioned by the detailed knowledge possessed in each field.

The vocabulary and the knowledge essential to identification and application in the most useful instances must be certainly mastered, and no opportunity must be lost to familiarize even partially and temporarily the mass of individuals with the terminology and information necessary to the most extensive application that is useful. It will not be fully mastered in formal instruction, but having once been in consciousness will either remain as partial concepts that can be made more adequate, or forgotten facts that may be at least vaguely recognized and more readily retained if they are re-presented.

Those certainly retained constitute a special phase of specific discipline and of the essential content as distinct from the information, which is the basis for varying apperception and mere remembrance. The others must be included among the useful relationships in which all "optional" knowledge and experience are to be presented, even though through lack of repetition necessary to make such relationships permanent they will be individually and variously apperceived or retained.

Within the academic subject, in particular in the abstract subject, however, the limit to the amount of knowledge that should be associated with the general stimulus lies in interference with the repetition necessary to the certainty of essential habits. Where, as in the case of arithmetic, for example, the stimulus to application is so general that its exercise results from the occasional necessities of every-day life rather than from the identification of a stimulus which is ever present, the mastery of all sorts of complex subject-matter remote from the life of the pupil adds unnecessary difficulties to a task difficult enough in itself. The so-called "new arithmetic" of the Herbartians, with its applications to the details of technical and specialized occupations unfamiliar to the

**The limited amount of concrete knowledge mathematically useful.**



general student, closely approaches this limit, if it has not left it behind.

In the case of observation and analysis, knowledge of details is more obviously essential. The observer trained systematically to note the details of chemistry and of physics may attempt to observe with equal care in botany, but is blind to much that the expert botanist can see. It was not merely for the sake of the habit of observation that Agassiz made a new student work for several weeks on one dead fish.

10. *The Eighth Condition to General Discipline, the Habit of Analysis in Each Essential Field of Application, Together with the Habit of Analysis and Synthesis on the Recognition of Any Part of a General Stimulus, with a View to Its Identification as a Whole.*

The eighth condition to general discipline is the formation of the habit of analysis in each of the fields in which it is most essential that a general stimulus should be identified, and on the recognition of any part of a familiar stimulus in any field, the habit of analysis and synthesis with a view to the identification of the stimulus as a whole.

I use the terms "analysis" and "synthesis" with due regard for Professor Dewey's distinction between an analysis and synthesis purely mechanical and quantitative, and an analysis which means "selective emphasis," and a synthesis which means "the interpretation of what is selected."<sup>51</sup>

The habit of analysis necessary to useful general discipline is something less than the habit of observation; and the habit of synthesis, something more. Analysis does not require the exhaustive and systematic noting of details peculiar to all observation, useful for retention and complete recall, but merely the noting of details until some stimulus or part of a possible stimulus appears. Observation, unlike synthesis, does not require the constant combination and recombination of the identified and hence suggestive part with other

details until the stimulus as a whole is identified. As pointed out by Alexander Bain, drawing results in an observation which, having reproduction for its aim, is little likely to be synthetic. The analysis worth while from the standpoint of general discipline is what Dr. Adams shows to be true of the "observation" of Sherlock Holmes—not observation in the usual sense at all, but analysis followed by synthesis and reassociation.<sup>52</sup>

Sometimes the possibility of application in a seemingly remote environment flashes upon a thinker through the selection and identification of some detail that forms part of the stimulus. That is, what Professor James used to call "sagacity" comes into play. More frequently one is confronted with a proposition or situation as a whole which gives some hint as to the sort of stimulus that should be identified—an original problem in geometry where analysis will separate out equal lines and angles, or a new city with possible factors that in combination form the stimulus for the judgment "manufacturing center." From the standpoint of sagacity, on the other hand, application has no limit. In an environment not formerly associated with it, a flash of insight suggests the usual stimulus to some habit or relationship that may be brought into play. In either case, analysis and synthesis must follow. But the cue to purposeful analysis is usually the presence of a situation or proposition which presents some temporary interest or which one has formed the habit of analyzing. That is, general discipline will not only fail to operate where one is ignorant of details, but in combinations of familiar details to which one has not formed the habit of carrying over relationships, or in which one is not otherwise interested. Here it is plain, on the one hand, that the many-sidedness of interest to which apperception gives rise is a condition to the incidental operation of general discipline, and on the other, that in place of the impossible habit of analyzing every environment with which one is confronted, must be substituted the habits of

**Analysis commonly due to temporary interest, or the habit of analyzing in particular fields.**

analyzing the particular situations to which the relationships made certain through direct preparation for life must be applied.

Where the stimulus is not composite, analysis is all that is necessary for its identification. If the habit has been certainly formed, the identification of its stimulus will at once result in its operation, but where the stimulus is composite, recognition of its several parts by no means carries with it its identification as a whole. Two sides of one triangle may be recognized as equal to two sides of another, and the included angle of the one may be recognized as equal to that of the other without sides and angles being combined into the familiar stimulus "two sides and the included angle." Here, again, there can be no habit of synthesizing all details, but rather the habit of combining and recombining details in fields of knowledge and experience where the habits to be applied may be expected to usefully operate. Information or experience in most minds embraces far too many details for their occurrence to be accepted as a general stimulus to either analysis or synthesis. Indeed, except in the case of a monomaniac, varying interest and attention would make this impossible. Conditioned, as general discipline is, by habits whose stimuli cannot be general, the only certainty of its useful operation is in making analysis and synthesis habitual in the specific field to which general discipline is to carry other habits.

**Recognition of parts of a composite stimulus must be followed by synthesis.**

In the case of the more concrete stimulus, identification may be direct, or partial identification may precede analysis and suggest it. The identification of a more abstract stimulus in concrete form, however, not only requires analysis, but the analysis is itself conditioned by knowledge of the concrete details of which the stimulus is a part, or of the specific response for which it is the signal. For example, to solve a problem through the fundamental principles of percentage the habits of synthesis and analysis must be associated with any problem in which hundredths figure. The

readily apparent presence of the rate per cent. is itself the signal for analysis, with a view to identifying the stimulus of which it is the whole or a part. If the rate per cent. itself is to be determined, it in itself at once becomes the whole stimulus to the division of the percentage by the base. If not, its recognition as a partial stimulus should become the first step in an analysis which finally supplies cost or gain, amount purchased or commission, etc., followed by a synthesis which completes the stimulus as per cent. and base, per cent. and percentage, one plus the per cent. and the "amount" or one less the per cent. and the "difference." The failure of pupils to identify the stimulus as a whole after partially recognizing it in the per cent. may be due to the absence of the habit of analysis, but more frequently to the absence of the habit of synthesis or to lack of knowledge of the terms which denote the whole number of hundreds on which the per cent. is taken and the number resulting from the taking of the per cent. If pupils have never been taught the principles of percentage at all, and are wholly dependent upon the more abstract stimulus of multiplicand and multiplier, multiplier and product, or product and multiplicand, not only must analysis and synthesis become associated with any problem involving times more or division into equal parts, but further and more difficult analysis and synthesis become necessary without a knowledge of details becoming any less essential.

**The most general useful stimulus most useful potentially, but the concrete more certain.** The most general stimulus that is useful is always the most useful, and in number the most abstract stimulus is always potentially the most useful, because a numerical stimulus cannot become too general. But the more concrete stimulus is the more certain. To identify cost and rate of gain or rate of commission and commission requires less complex analysis than to identify multiplicand and multiplier or multiplier and product, and ensures readier judgment than when cost and rate of gain have to suggest base and rate, and base and rate, multiplicand and multiplier, before the judgment "multiply" results.

This is one reason why each general stimulus must be certainly and permanently associated with a few of its most useful and suggestive applications. Thus associated, however, they are not merely specific and, hence, certain habits, but serve to make easier recognition of the general stimulus in similar concrete forms.

Academic analysis and synthesis are readily associated with the fields in which they are academically useful: mathematical problems, flowers, forms of life, minerals, chemical substances, movements, and forces. That is, the analysis and synthesis necessary to general discipline within a so-called "specific discipline" can be readily made habitual. This is in part true of the "specific discipline" necessary to direct preparation for life, which may or may not include the academic disciplines. The analysis and synthesis necessary to morals, health, industrial efficiency, social service, good citizenship, and right avocation must be associated with particular phases of diet, respiration, clothing, particular occupation, government, or public welfare. From the standpoint of general discipline, the fundamental difference between the habits of analysis and synthesis due to specific academic discipline and those due to equally systematic and specific preparation for some phase of life, is that the mastery of the academic discipline does not demand that they shall be carried over into life in general outside the fields in which they can be certainly associated, and that the direct preparation for life does. It is not necessary to a pure science that it shall be applied at all.

**Only direct preparation ensures analysis and synthesis outside the academic field.**

On the other hand, the habit of analysis and synthesis necessary to carrying over as a means to direct preparation is identical with the habit necessary to such general analysis and synthesis as may be useful—that is, the certain association with the identification of any detail as part of a general stimulus, of analysis and synthesis with a view to the identification of the stimulus as a whole. While analysis and synthesis in the academic subject, and more especially in the

formal discipline, can be thus suggested by the partial identification of some stimulus, all that academic proficiency requires is that they shall be suggested, as already pointed out, by the presence of the particular type of material ordinarily associated with them. Language will suggest the analysis necessary to grammatical or rhetorical form. Matter of a particular kind will suggest the analysis and synthesis of botany, zoölogy, or geology; and particular manifestations of matter, that of chemistry or physics. The object of the academic study is not to make as independent and probable as possible the carrying over of its relationships into every useful field, but to make the learner capable of applying them whenever he is called upon to do so. That is, outside of the academic subject matter itself, the aim is not self-activity and a continual analysis and synthesis on the recognition of any part of the usual stimulus, but the ability to analyze and synthesize if application is demanded. While an industrial specialist or a specialist in pure science may seek new applications, the general student trained in chemistry, for example, either brings it to bear in explanation of phenomena with which it has already been associated, or in the solution of some problem with which he has actually been confronted, obviously chemical in its explanation.

Now, although the habits of analysis and synthesis necessary to morality, health, industrial efficiency, social service, good citizenship, and even right avocation are in part like those involved in academic study suggested by specific kinds of experience, they most frequently operate not only when the specific phase of experience which suggests them is lacking, but when the specific experience presented is strongly suggestive of other groups and systems of thought which tend to exclude them. For example, the failure of a street railway conductor to collect a fare may suggest official carelessness and consequently failure to call out streets, lack of courtesy and so on—a sufficiently potent group of ideas to distract attention from the passenger's personal responsibility for payment, unless the very idea of fare in part, at least, suggests it,

and raises the question of honesty. If it does, analysis and synthesis must at once determine the presence or absence of the general stimulus to the judgment honest or dishonest.

The various specific phases of direct preparation for life differ widely in the extent to which they can, like the academic subjects, depend upon specific forms of experience to suggest analysis and synthesis. More than this, it is possible to ensure the carrying over of habits of analysis and synthesis from the academic subjects. But with the former it is essential; with the latter, artificial. Just as the formal subjects, through their essential certainty and system, favor specific discipline, so do the systems of relationship made equally certain in their furtherance of every-day life, naturally favor general discipline.

A minor distinction unfavorable to the study of the abstract subjects as a means to general discipline lies in the fact that the specific kind of experience which suggests their habits of analysis and synthesis is for the most part concrete and tangible—word forms, symbols, lines and angles, objects and other phenomena of sense, while both life and direct preparation for it require a far greater proportion of analysis and synthesis of ideas unassisted by things.

**Life requires analysis unassisted by concrete details present in "abstract" subjects.**

Finally, although in both the formal subjects and direct preparation for life, the association of cumulative impression with a general stimulus, its apperception as a center for concentration, its certain association with various typical fields and frequent association with favorable fields outside its own, and frequent effort to discover new applications, may point the way to analysis and synthesis where they will be most useful; they are naturally developed in the abstract or even the academic subject only through specialization, while they are as essential to direct preparation for life as is specific discipline itself.

In both academic work and that directly preparatory to

life, innate interests, varying interests, and the interest that arises from even temporary concentration should be utilized as a favorable condition for analytical and synthetical work with a view to general discipline. The fact that analysis, like observation, when effectively exercised in one field, is for the time being at least less probable in any other, merely emphasizes the importance of temporary or changing interests and concentrations. This is why thesis work, involving weeks of research, possesses such marked advantages over frequent and unimpressive papers which are necessarily mere compilations or transpositions, valuable mainly from the standpoint of written repetitions of facts and drill in form of expression.

The habit of analysis and synthesis certainly associated with the identification of any part of a general stimulus is the best antidote for "too hasty interference" and "jumping at conclusions." Wherever there is opportunity for it, each part of the stimulus as a whole must be identified before the sequence or the habit results. The very "hastiness" and the tendency to "jump" are invaluable if they lead toward the stimulus as a whole instead of skipping over to its consequences.

Where certain parts of the familiar general stimulus are found to be missing, drill in adaptation should be substituted for application. Here, adaptation, in place of being dependent upon a sufficiently general stimulus, takes the form of noting whether or not the variation in the stimulus does or does not seriously modify the ascertained result, or of actually attempting variation in the stimulus with a view to a desirable modification of the result. All experimental sciences involve adaptation as certainly as they ensure application. The drill necessary to the formation of this habit, however, not only does not demand the mastery of any one of them as a whole, but the modified stimulus or result which is a signal for its operation will be associated with more

**Varying interest a favorable condition to analysis and synthesis.**

**Value of the drill in adaptation involved in scientific experimentation.**



fields of experience, and general application made more probable, if the habit is formed through experimentation with material selected from a variety of sciences.

On the contrary, mathematics as an exact science tends to make the individual so certain of his judgment in the absence of the modifying conditions which its abstractness eliminates, that on the identification of a familiar stimulus as a whole the usual judgment is likely to follow with an inexorability and self-confidence which leave no room for adaptation. After all, human nature is such that the easiest habit to carry over from mathematics to life in general is a strongly increased confidence in the infallibility of one's own conclusions. The common impression that, somehow or other on account of its exactness, the study of mathematics tends to make one more truthful, fails to take this tendency into account. If exactness results in a narrowmindedness that focuses attention on the correctness of small details of life, without the due sense of proportion and the broader perspective of which modifying conditions form a part, the resulting truth is partial and misleading. It is well to remember that the exact science which has made the most helpful contribution to modern logic is in itself alone inadequate not only as a general discipline for reasons already discussed, but from the standpoint of adaptation and of truthfulness. Life is not abstract. Its conclusions are continually being modified by its many-sidedness, and its exact statements, though true in themselves, are often the farthest swing of the pendulum from whole truths.

**Mathematics in itself ill-suited to develop the habit of adaptation or truthfulness.**

## CHAPTER IV

### THE COMPARATIVE USELESSNESS OF THE OLD "DISCIPLINARY" OR "FORMAL" SUBJECTS TO ALL PHASES OF FORMAL SELF-ACTIVITY EXCEPT SPECIFIC DISCIPLINE

THE necessity for this complex analysis of educational self-activity now stands revealed. A discipline no longer formal in the traditional sense cannot be the sole alternative and complement of knowledge and culture. In the new sense of *general* discipline, it is only one among several forms of educational or formal self-activity, all of which are interrelated and interdependent. Apperception also is too vague a term to displace it, even when used in as inclusive a sense as formal discipline itself. *Varying apperception* is the complement of *specific* discipline, and with it and *cumulative impression* a necessary condition to *general* discipline. *Mere remembrance* is the initial step by which experience that does not fade away into impression becomes specific discipline and varying apperception.

#### 1. *The Usefulness of an Idea or Activity Dependent Upon the Relationships in Which It Is Retained and Recalled*

From the standpoint of instruction, knowledge depends for its usefulness solely upon the relationships in which it is mastered. In *forgotten* relationships it gives rise to impression which as common feeling centered upon a useful idea becomes cumulative in its force and creates an emotional center. In *partial* relationships, it results in mere remembrance which holds an idea in mind, usually in incidental associations varying with individuals, until its relationships are multiplied by varying apperception or made certain by specific discipline. In *many-sided* relationships it produces varying apperception through which it may be carried over to any other directly or

indirectly related ideas, and they concentrated upon it. In *definite* and *certain* relationships, it leads to specific discipline, on which the permanence of all fixed relationships, the usefulness of varying apperception, and the possibility and usefulness of general discipline depend. Even here it emerges from information only as its relationships result in system. In *definite and specific relationships having a general stimulus*, it furthers general discipline, the only means by which the certainly useful can be applied in all possible fields of experience.

2. *The Usefulness of Relationships Can Be Measured Only Through Degree of Inherent Sensation or Emotion that is Useful, the Number of Relationships in Which They are Potentially Useful, and the Number of Their Useful Recurrences in Every-day Life*

Now if by usefulness is meant either direct or indirect furtherance of the educational aim, the usefulness of a single relationship or a system of relationships, whether of knowledge or activities, can be measured only through the degree of useful sensation or feeling inherent in it, the number of relationships in which it is potentially useful, and the frequency of its recurrence in such relationships in every-day life. In cumulative impression the degree of inherent sensation or feeling is determining; in mere remembrance and varying apperception, possible many-sidedness of relationship and frequency of recurrence; in general discipline, all three. Here interest, many-sidedness, and frequency of recurrence not only unite to increase the probability of usefulness, but through greater impressiveness and likelihood of repetition themselves tend to ensure certainty. Either for a single relationship or a system of relationships, whether regarded as a whole or as an aggregate of the parts and relationships which comprise it, the test is the same. That is, a specific system of knowledge and activities can be evaluated in part and as a whole through the aggregate worth of component single relationships, measured by sensational or emotional appeal, many-sidedness, and recurrence.

3. *Since the Relationships Directly Useful in Highest Degree Are Capable of Being Indirectly Useful in the Highest Degree, the General Course of Study Must Emphasize Subjects Containing a High Proportion of Directly Useful Material*

Holding in mind the fundamental distinction, ignored by Mr. Spencer but pointed out by W. H. Payne and others among his critics, between what is useful to the race through the specialist and what is directly useful to all, it is clear that every branch of human knowledge will continue to figure in the course of study. Most have subject-matter directly or indirectly useful to all. Some contain material useful only through the specialist. But general education will exclude all subjects as wholes which are useful to all as wholes, through their disciplinary value alone. More than this, all learners,

Concentration through specialization an inadequate remedy for ineffective discipline.

including the specialist, must master, on the one hand, the subject-matter directly preparatory to life, and, on the other, that which is essential to useful general discipline. The present tendency toward a paralleling of a many-sided course of study with intensive work in two or three formal subjects required in common of all might be pedagogical, were it not for two facts. On the one hand, the formal subjects have been demonstrated to be not only unnecessary to general discipline, but to a limited extent disadvantageous to it. On the other, the systematic organization of material with a view to direct preparation for life has just as certainly been demonstrated to involve the formation of all habits that should be generally applied, and to be to a serious extent essential to the general application of useful habits wherever they may have been formed. If the truth of these two propositions has been demonstrated, the traditional position of the abstract subjects and that of those more directly preparatory to life must be reversed. The abstract subjects must become the electives, and the subjects directly preparatory to life the required subjects. As re-

guards the necessity for direct preparation, no demonstration is necessary. As regards the superior efficiency of direct instruction as a means to the indirect furtherance of the educational aim through the formal phases or educational forms of self-activity, recapitulation cannot but be convincing.

4. *The Study of the Formal Subjects But Little Favorable to Phases of Formal Self-activity Other Than Specific Discipline*

From this point of view, the advantage of the old "formal subjects" over the academic branches lies in the fact that they are formal through their essential organization and the method inherent in their organization. Their adequate mastery compels the certain and systematic specific discipline which in other subjects is far more largely dependent upon pedagogic method and not inherent in an inevitable organization of their subject matter. While in the case of other academic subjects the same certainty and system are possible through pedagogic method, in direct preparation for life it must be compelled. Morality and religion, health, industrial efficiency, and citizenship cannot be adequately taught unless they are formally taught in the true sense—with each form of educational self-activity certainly developed, including a more certain and more systematic specific discipline than that of a branch of mathematics or a language. At this point, however, the formal subject has the right to throw down the gauntlet which direct preparation can only theoretically pick up until the necessary organization has become actual.

From the standpoint of general discipline and all other formal phases of self-activity, the supremacy of mathematics and the languages is irretrievably lost, while that of direct preparation for life is irresistibly destined to become more complete. Cumulative impression, both in itself and as a favorable condition to general discipline, demands subject matter which is inherently emotional or which is made so through its form of expression. This involves, in place of the formal subjects or in addition to them, the utilization through

direct instruction of selections both from emotional experience and literature and art, made on account of their emotional expression of ideas which should dominate life and character. Artistic expression and appreciation, as distinct from emotional sensibility and æsthetic enjoyment, are from this point of view not essential to the mass of individuals, and, indeed, are possible in any high degree only to the specialist—on the side of appreciation, the specialist in culture, on that of expression, the specialist in art. In fact, since analysis and discrimination tend to lessen emotion, both sensibility and æsthetic enjoyment may actually be lessened through artistic training.

Mere remembrance, dependent as it is on connection with individual experience, like the varying apperception which it conditions, finds little encouragement in abstract subject matter. It helps more in the mastery of the abstract subject matter than the abstract subject matter helps in developing it in every-day life. That is, any idea, no matter how abstract, may be temporarily held in mind in some incidental or even ridiculous association. But it is the subject matter full of vastly more concrete details than can be certainly remembered that profits most from mere remembrance and makes the most useful contribution to it.

##### 5. *The Limited Contribution to Formal Self-activity Resulting From the Elementary Study of a Foreign Language*

Even in the case of language, it is only in the general sense of the partial mastery of mere words in the vernacular and

<p><b>Mere remembrance and varying apperception furthered by the ready use of a foreign language.</b></p>	<p>not through grammatical terminology or technique that it makes its fundamental contribution to mere remembrance. Both mere remembrance and varying apperception, however, are aided by the mastery of a foreign language in the instrumental sense. They are not materially furthered through the process of mastery, except in the added associations given words through etymology, and a broadening of their information and inter-</p>
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ests through the translating of passages that could have been far more readily acquired in the vernacular. The increased many-sidedness comes through the mastery of a language as a ready means of gaining knowledge and experience not accessible in the vernacular, or of adding to that which is. Thomas Arnold's appeal for the classics, in so far as it was not disciplinary, was made from this point of view: "Expell Greek and Latin from your schools, and you confine the views of the existing generation to themselves and their immediate predecessors. Aristotle and Plato and Thucydides and Cicero and Tacitus are most untruly called ancient writers. They are virtually our own countrymen and contemporaries, but have the advantage which is enjoyed by intelligent travelers, that their observation has been exercised in a field out of the reach of common men, and that having thus seen in a manner with our eyes, what we cannot see for ourselves, their conclusions are such as bear upon our own circumstances."<sup>53</sup> But as Alexander Bain pointed out, with the exception of a certain æsthetic quality inherent in the form of a language as distinct from the thought which it expresses, its whole benefit from this instrumental point of view, its culture and its knowledge, can be acquired through the reading of what others have translated.<sup>54</sup> Since, as President Hall's investigations have helped indicate, the mass of students in high school and in college fail to attain either the degree or the stage of advancement at which a language becomes instrumental, it follows that either more thorough instruction or more time must be given to those whose mastery is attempted. This, as in the case of discipline, justifies concentration, but, like it, not a concentration required in common of all students. The knowledge, the culture, and the experience that cannot be obtained through the vernacular are in America necessary only to the specialist. This fact is recognized by the present requirement that each arts and science student shall master one or two languages, without the specification of any particular one. If no one language

**Such ready  
use involves  
continuous  
study.**

opens the way to a knowledge, culture, and experience which, in addition to what is furnished through the vernacular, must be required of all, it follows that the requirement of one or two is wholly unjustifiable. A particular one might be required of all on the ground of its special fitness for a discipline peculiar to language study in general. This peculiar discipline, however, reduces itself to linguistic habits which can carry over from one language to another, of which the carrying over the habit of noticing the spelling of foreign words to English words is one of the most practical examples. But quite aside from the further arguments developed in the present discussion, Mr. Bain long ago demonstrated that language study involves no general discipline exclusively its own,<sup>55</sup> which applies outside the linguistic field itself. It is true, of course, that a large proportion of individuals need

<p><b>Ready use of foreign language essential to many, but not to be re- quired of all.</b></p>	<p>some language or languages other than their own for the sake of knowledge and experience not possible through the vernacular alone—for the sake of travel, for the pleasure of some specific culture, for the sake of some industry or vocation, for the sake of some field of advanced study.</p>
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This means, however, that the majority will necessarily elect some language or be required to take it as a condition to some phase of specialization, and not that the study of foreign language, especially of a specified foreign language, shall be required of all.

#### 6. *The Limitation to the Formal Value of Mathematical Study*

While a certain proportion of the instructors in mathematics who responded to the questionnaire of the American sub-committee of the international commission on the teaching of mathematics insist on the cultural value of the subject, the majority ignore this phase of its possible usefulness altogether.<sup>56</sup> This is significant of the limited extent to which many-sidedness is inherent in mathematical study. Obviously, it neither abounds in a wealth of ideas and activities which will add to the apperceiving mass through incidental



association with others, nor in ideas which incidentally remembered will constitute centers for varying apperception. As a pure science, its details certainly associated with each other give rise to specific discipline rather than to continually changing relationships. From the standpoint of application and general discipline, however, it is necessary to examine into the extent to which it demands varying apperception, and so promotes its development through reorganizing the subject matter of more concrete subjects.

If any branch of mathematics is related to life in a many-sided way, it is arithmetic. As has been already pointed out, however, the stimulus to arithmetical operation is too general for a varying association of number or numerical principles with all possible ideas to serve any useful arithmetical purpose. In general experience it is not recognition of the presence of number or the possibility of operation that should suggest operation, but the *need* of it. The few fields in which each mathematical principle is usefully and certainly applied in the every-day life of the majority of learners are, of course, definitely associated with it as part of the specific discipline of the subject. Even this can be overdone, as in the old association of percentage with brokerage, foreign exchange, and duties on imports. The experience and vocabulary essential to such applications belong to the specialist. It is not the possibility of teaching mathematical subject matter in many-sided relationships with life in general that is questioned, but its necessity to arithmetic and its usefulness to varying apperception. Dr. Eugene Smith, himself chairman of the sub-committee mentioned above, with Herbartian skill has associated arithmetical principles with a great variety of technical processes and other forms of specialized experience. Such association, however, though common in many modern text-books, is not necessary to as general application as is useful. In many instances the vocabulary and experience involved belong to the specialist, and are of necessity associated with the general principle

**The general application of mathematics independent of instruction.**

when he needs it in his work or his avocation. In others, they are already familiar to the pupils and need not be specially associated with the habitual arithmetical analysis

**Number too general in its application to recall many-sided associations.** necessary to the identification of the required principle. On the other hand, many-sided application is useless in the development of varying apperception whenever it is too general to call varying experience to mind. The fact that dollars and trilobites have been separately added or

have been separately associated with the idea of addition, unites them by a connecting link which, being suggestive of all objects and possible of suggestion by all, is little likely to bridge over the gap between any two. That is, number, neither suggesting its concrete applications nor being suggested by them, is little likely to associate them with each other, while its more concrete associations are not numerical associations at all. Outside its own subject matter, arithmetic *can* develop varying apperception as it can develop general discipline, but in both cases unnecessarily from the standpoint of varying apperception and general discipline. Its very demand of certainty makes varying association less likely, because practically all of its subject matter being made certain, there is little left for incidental remembrance and apperception. What is true of arithmetic is true of the higher mathematics as well. Mr. Bain summed the whole matter up when he said, "In the point of view of information, the uses of mathematics are more obvious; but these uses when carried to their utmost stretch, suppose special professions." He further asserts, however, that "In the examples of arithmetical and algebraic operations, much valuable

**The limit to the use of mathematics as a means to varying apperception.**

practical knowledge is incidentally obtained, and more might be done to turn the opportunity to account."<sup>57</sup> Dr. Smith has been wisely turning the opportunity to account. When a sufficient variety of applications are found in familiar experience, the limit to the use of mathematics as a means to varying apperception lies in introducing new

terms and concepts that add to the difficulty of the work, by either unnecessarily anticipating experience which will in due course of time become familiar, or trespassing upon the domain of specialization. Carried to this point, the "new arithmetic" is not arithmetic at all. If the only usefulness of mathematics lay in its contribution to varying apperception, it would not be necessary to include it in the general course of study.

7. *Varying Apperception Furthered by the Presentation of the Most Many-sided and Recurring Relationships Wherever Found*

On the other hand, literature, history, sociology, economics, the natural sciences, and all other subjects rich in concrete subject matter, with an abundance of relationships not made certain through specific discipline, both furnish continual material for varying apperception and demand its development. While even the seemingly most useless associations that experience brings about should be welcomed in so far as they are not antagonistic to the educational aim, it is the function of instruction to further a useful varying apperception by presenting for incidental association ideas most many-sided and frequently recurring. This means selection from all phases of human experience and branches of knowledge whether real or abstract, on precisely the same principles as in the valuation of material from the standpoint of direct preparation. In the case of indirect preparation, however, many-sidedness is in itself useful regardless of whether the relationships in question are known to further the educational aim or not. If they are known directly to further it, many-sidedness and frequency make furtherance exceedingly probable. Hence, from the standpoint of varying apperception, the potential usefulness of all directly useful material is measured by many-sidedness and frequency. If they are not known directly to further the aim, the possibility of furtherance as well as its extent are measured in the same way.

8. *Material Organized for Direct Furtherance Most Useful to Varying Apperception, Because it is Composed of the Most Many-sided and Frequently Recurring Relationships from all Branches*

However, material organized for the direct furtherance of the aim, both in its furnishing of material for varying apperception and in the necessity for its furtherance of it, possesses great advantages not only over the abstract subject, but over those branches organized from the academic viewpoint alone. Over the abstract subjects, because it must involve the presentation of a vast amount of potentially useful material which cannot be certainly memorized, and because its relationships which are made certain depend for their highest usefulness upon their varying apperception of and through what is thus potentially useful. Over even the academic subjects most rich in content, because both its potentially useful material, and that which is made certainly useful, must be the most many-sided and frequently recurring that all branches of knowledge and phases of experience can afford. Finally, it must not be forgotten that even in specialization, the usefulness of an academic subject in the furtherance of varying apperception and in utilizing varying apperception for the furtherance of its special aim depends upon the many-sidedness and frequency of recurrence of the material presented to the learner.

9. *Recapitulation of the Advantages of Direct Preparation Over the Formal Branches in the Furtherance of General Discipline*

From the standpoint of general discipline, the advantages of direct preparation over the formal subjects have already been demonstrated. Every advantage it possesses for cumulative impression, mere remembrance, and varying apperception ensures a condition advantageous to general discipline. Direct preparation compels continuity of habit. The abstract or academic subject which does not become a

part of either direct preparation or specialization is soon forgotten.

Direct preparation compels a highly complex system which is itself a part of life. The pure science and abstract subject are inherently remote from life, and the formal discipline is at times selected on account of its extreme remoteness. Yet the usefulness of the academic subject to a general discipline that is not confined to its own subject matter is wholly dependent upon many-sided relationship to life.

The general application in life of habits having useful general stimuli is essential to direct preparation. For the academic subject and especially for the formal subject general application outside its own subject matter is wholly unnecessary. The very method inherent in the formal subject, while compelling specific discipline, is hostile to general discipline. In direct preparation all habits that are made certain are generally useful in life outside the school, and can be so taught that their stimuli are just general enough to be useful. In the formal subjects, in order to master the habits that are generally useful, far more that is only specifically useful must be just as certainly made habitual, while the stimuli to the generally useful habits cannot be limited except through the certain association with them of particular fields of application.

Finally, useful general discipline through the formal subject is found to be absolutely dependent upon both specifically associated knowledge outside the formal subject matter and upon habits of analysis and synthesis in specific fields or in response to specific stimuli, which, after all, must be developed through direct preparation.

Even the single advantage for specific discipline which remoteness from life gives to abstract subjects or pure science involves a disadvantage which far more than counterbalances it. It is true that the subject matter of branches whose content is concrete or directly useful, on account of its concreteness tends to be more firmly associated in the minds of the students through individual and varying apperception

than through the relationships most specifically useful or those essential to general discipline. Although this may mean more immediate distraction than while abstract relationships are being formed, it also means that the ordinary operation of individual apperception is far less likely to call abstract relationships to mind. Number symbols and formula apply

to units, not to things, and are too universal either for things to call them to mind or for them in themselves to constitute a suggestive and apperceiving mass for every-day experience. But if general sequences and groups high in their relative usefulness are, in spite of the constant struggle against purely individual apperception, once certainly and persistently formed, they ever continue to serve as a means not only to the apperception of new material in the relationships

**While many-sidedness may distract attention during the mastery of essentials, it finally makes them dominant.**

in which it will be most directly and certainly useful, but continually recalling individually apperceived material and being recalled by it, they act as a persistent reorganizing force and cumulatively increase the usefulness of the whole mental content. Even if this reorganization were as possible in the case of the formal subject, it would not be as useful. The counteraction of individual and varying apperception, in itself so useful, must, therefore, be met by a more systematic and determined effort firmly to memorize and retain the general groups and sequences most essential to a *useful* general discipline. They, and not individual apperception, must, through continual, 'unvarying, and, hence, mechanical repetition, come to dominate.

#### 10. *General Conclusions Concerning the Course of Study*

In short, from the broader standpoint of formal *self-activity*, including *general* discipline, the traditionally "formal subjects," formal through a *formal* discipline which the "faculty psychology" fully justified, are not only not exclusively formal, but lack the educational or formal certainty and potentiality of direct

**General propositions**

preparation. As regards the course of study, four momentous and more or less revolutionary conclusions are apparent: First, no subjects, especially no abstract or formal subjects, such as the languages and mathematics, can be required as wholes on disciplinary grounds alone. Second, the curriculum "required" in common of all should include only those subjects as wholes or parts of subjects, that are directly useful to all individuals who are not specialists, or that, like the mother tongue and basal geographical and historical associations yet to be discussed, are indirectly useful in the highest degree through the many-sidedness and frequency of recurrence of their subject matter in every-day life. This does not mean that each individual may not also be required to take some specialty, but rather that all individuals shall not be compelled to take the same specialty on formal grounds alone. Third, to form the content of this required curriculum, selection of relationships must be made from the whole range of human knowledge and experience on the basis of the degree of sensation or feeling and the relative many-sidedness and frequency of recurrence through which they directly and indirectly further the educational aim. Fourth, the resulting subject matter must be organized and taught with a view both to the direct furtherance of the aim through a highly systematic specific discipline and cumulative impression, and its indirect furtherance through both it and the remaining forms of self-activity—that is, mere remembrance, varying apperception, and general discipline.

11. *The Greater Part of Mathematics, Exclusive of Arithmetic, Must be Eliminated from the Required General Course*

To sum up the effect of all this upon the curriculum as at present organized—mathematics, with the exception of limited parts of its elementary branches, is handed over to the specialist. In elementary arithmetic, indeed, the process of elimination is already almost accomplished, if it has not here and there been carried too far to ensure ready and com-

Probability  
of a broader  
elementary  
course in  
mathe-  
matics.

plete mastery of its directly useful principles. When old Thomas Hill of Harvard, the forerunner of elective systems, though the first text-book maker to popularize originals in geometry, insisted that the study of higher mathematics should be "only for those of mathematical ability,"<sup>58</sup> he had in mind a far broader course in mathematics for the elementary school. Perhaps the selection of the mathematics directly useful to all, in so far as such selection is possible from an exact science, will ultimately realize his ideal. Although algebra and geometry as systematic wholes will no longer be required, it is essential that the required elementary course shall include enough algebraic and geometrical subject matter to develop mathematical interest and to determine individual fitness for mathematical specialization.

For the sake of continuity, the study of mathematics, including that of generally useful phases of arithmetic, should be distributed at weekly or semiweekly intervals throughout the entire high school course. For the additional reason that failure to develop mathematical interest or ability in the high school may in the case of some individuals be overcome by different instructors, changed methods of instruction, and other conditions, it should be continued for the first half year in the college. But mathematics as a required study should no longer include material useful only to the specialist, should no longer be concentrated into one or two years of the high school course and then forgotten until it is partly revived in the college, should no longer consume the whole of a hopeless college year for those not interested in it or who are not compelled to become so through the demands of a chosen specialty, and, above all, should no longer involve the absurd and harmful requirement that a year of mathematical failure shall be compensated for by the repetition of the same course until failure is transformed to success. The moral training involved in voluntary persistence in the face of mathematical failure is invaluable to those students who must master mathematics to succeed in some specialty which involves it.



In the case of others, it is robbed of all incentive, drives them into moral and intellectual apathy or rebellion, and with similar insistence on the mastery of a particular language, is one of the chief causes of students dropping out of college, or of their failure to gain the interest in alternative subjects that will urge them on to independent achievement. It is in regret over such wasted opportunity in his own early years at Oxford that Mr. R. H. Quick quotes the following passage from *Henry IV*: "I beseech you heartily, scurvy, lousy knave, at my desires, and my requests, and my petitions, to eat, look you, this leek: because, look you, you do not love it, nor your affections, nor your appetities, and your digestions, does not agree with it, I would desire you to eat it."

If these conclusions appear radical and antagonistic to prevalent opinion, it should be remembered that they *are* conclusions whose disproof is possible through demonstration of the fallacy of the cumulative propositions on which they have been based. It should also be held in mind that they apply to only a limited portion of the student body.

Because all students of the sciences in their most advanced stages, and of the various branches of engineering and other professions require thorough knowledge of the higher mathematics, and even because a multi-  
 tude of mathematical instructors are in consequence required, a very large proportion of the whole mass of students will specialize in mathematics. The science of mathematics will lose nothing from the fact that students not interested in it and who do not need it as a part of their direct preparation for life are eliminated from mathematical classes. On the contrary, with smaller and more earnest classes on the one hand, and greater continuity through academic and professional specialization on the other, the mathematical work of the college and university should become more efficient. At present this favorable condition can be brought about, and is in part brought about, only by driving men not adapted to mathematical study out of college. It is better, after all, to

Advanced algebra and geometry as electives will result in more thorough training.

attain it by permitting them to gain their general discipline in some other way. The magnificent specific discipline inherent in the mathematical subject matter has not been questioned. It will be more certain and complete, however, and self-activity within the specialty from the solution of originals in geometry to research in the newest and most abstruse phases of the science be the better assured, if the conditions already discussed as favorable to general discipline are brought about through pedagogical method within the mathematical field itself. Beyond that, mathematics does not require discipline to go, though in part it can and, in varying degree with individuals, it will.

12. *Although One or More Foreign Languages Are Useful to Most Students, They Should be Required Only of Those to Whose Specialization They Are Essential*

Much the same can be said of the foreign languages, as distinct from foreign literatures. Greek has already been handed over to the specialist—to the specialist in culture as well as in theology, philosophy, and philology. Probably a carefully limited amount of Latin etymology will be found to be of high usefulness in the mastery of the meanings of English words and especially in their spelling. That is, in place of the usual effort at exhaustive lists of Latin derivatives, all examples that mislead from either the standpoint of meaning or of spelling must be omitted. Outside of this, and indeed in most cases including this, Latin has also become a phase of specialization, except in institutions which can afford to offer but one or two languages, and must require them of all, because alternative courses cannot be given. Particular modern languages have never been required except as involved in some phase of specialization. At least two languages, ancient or modern, however, are still generally required for college entrance and as a condition to graduation. It is this requirement that in the small high schools and colleges still forces a particular language upon all students.

That is, the fault is directly economic and only indirectly pedagogic. The New York High School Teachers' Committee has raised the question as to whether but one required language cannot be substituted for two.<sup>59</sup> Woodrow Wilson would substitute more. In the light of the preceding discussion the answer is plain. Since it is an incontrovertible fact that both direct preparation for life and the adequate development of every formal phase of self-activity are possible without the study of any foreign language, neither one nor more, but no foreign language should be required except in so far as it is involved in such parts of etymology as are helpful to the mastery of the vernacular itself. It is true that the concrete indication of grammatical distinctions through an inflected language might, as Alexander Bain has pointed out, make the transition from Greek or Latin to English an instance of proceeding from the subjectively simple to the complex. But where the essentials of English grammar have been mastered before the study of the foreign language is begun, this advantage becomes impossible or reduces itself to a review and concrete re-enforcement of distinctions but partially mastered that should and could have been thoroughly mastered. That translation in general and Latin etymology in particular aid in the mastery of the English language, and should be made so to aid far more effectively where specialization demands the foreign tongue, is a readily apparent fact. But no unprejudiced thinker will seriously contend that the years of study necessary to free translation are economically spent by an individual who does not need the foreign language either as a means to specialized study or experience, as a relatively effective mode of developing formal self-activity, or as a special instrument to culture, many-sided knowledge, and experience. Neither a branch of the higher mathematics nor a foreign language should be uniformly required of all who enter college or who seek a general as distinct from a specialized college education.

**Though no one foreign language should be required, most students should master one or more.**

Dr. Wilson's argument for more foreign languages rather than less as a requirement for college entrance,<sup>3</sup> being based upon the greater relative readiness with which the languages are mastered by children, and, as he might have added, the continuity of instruction made possible by their early study, applies only on the assumption that the languages are essential to all and that the more of them that are mastered the better. That is, he assumes what his argument is meant to prove. So far as many individuals are concerned, he is undoubtedly right, but there is a multitude of college graduates who never fully mastered the languages which were required of them or never put them to use outside the college walls.

If, from the standpoint of specialization, the majority of individuals will continue to elect or be compelled to take the higher mathematics, a far greater majority will continue to pursue the study of one or more languages, owing to their wider usefulness and the greater number of specialties likely to require them. As already pointed out, aptness for linguistic study and the pleasure derived from it, love of some special field of culture, advanced scientific research, foreign business or foreign travel, even the demands of certain forms of social life, unite to make the omission of language study more or less exceptional. Indeed, there is a certain social tendency toward the study of what almost all educated people study. The abolition of the higher mathematics as a required subject in general education, by increasing the time available in high school and college for other study, will tend in the same direction. Moreover, as in the case of mathematics, the elimination from language classes of all individuals who neither through natural fitness or the demand of specialization are interested in language study will increase the thoroughness and the continuity of instruction.

So long as even the exceptional individual can be broadly cultured, effectively disciplined in the more inclusive sense of formal self-activity, and directly and effectively prepared for

**Limited  
attendance  
in language  
classes will  
result in  
more effi-  
cient work.**

moral and healthful living, social service, good citizenship, and his individual vocation and avocation without the study of a foreign language, the study of a foreign language should not be compelled either for entrance to a general college course or its completion.

From the standpoint of general discipline within either a particular foreign language or the whole domain of linguistic study, a discipline of which the carrying over of grammatical and rhetorical habits from a foreign language to the vernacular is a part, pedagogical inquiry must, as in the case of mathematics, more seriously concern itself with the study of the conditions favorable to application. A highly important first step has already been taken through the discussion which preceded and followed the appointment in 1911 of the joint committee on grammatical nomenclature by the National Educational Association, the Modern Language Association of America, and the American Philological Association. Professor Hale has admirably indicated the desirability of a terminology general enough to unify language study and to make more readily possible the carrying over of combinations and judgments from one language to another.<sup>60</sup> Professor Kuersteiner has pointed out the fact that a less general terminology may be more readily understood and applied by school children in the mastery of one or two foreign languages.<sup>61</sup> Dr. Rounds has been a national leader in the effort to agree upon a common terminology for all English grammars and language books.<sup>62</sup> The bearing of this movement upon ready identification of the general stimuli involved in application of grammatical distinctions, and, therefore, upon general discipline within the field of language, is highly important, while the analytic nature of the discussion which characterized the recent Symposium on language teaching held under the auspices of the Michigan Schoolmasters' Club is prophetic of a valuable contribution by the national committee.

**General discipline within the languages dependent on pedagogic conditions.**

13. *Bearing of the Analysis of Formal Self-activity Upon the Place of the Natural Sciences in the General Course of Study*

The effect upon the natural sciences of the conclusions reached from the analysis of formal self-activity is less revolutionary. Although most colleges have been including in their required course of study at least chemistry and physics, the movement has already begun toward requiring an equal or a greater amount of work in one or two sciences elected from the whole group, rather than the customary amount of work in one or two specified sciences. For example, it has been proposed to substitute for, say, two required units of work in physics and chemistry respectively, three units of work in each of any two of the natural sciences. The dominance of experimental method in all the natural sciences vitiates the objection which might have been urged against this on the ground of Bain's distinction between the disciplinary value of the experimental sciences and of sciences of classification. As against requiring any pure sciences *as wholes*, however, much the same arguments apply as in the case of the languages. Since the entire system of knowledge and activities belonging to any one of the sciences is non-essential to many-sidedness and culture, the requirement of one or two sciences as systematic wholes is obviously based upon disciplinary grounds alone. And on that ground it would be justified, if the useful training in adaptation as distinct from application involved in experimental work were peculiar to the natural sciences alone. While scientific method

A partial study of science adequate for formation of the habits peculiar to experimentation.

is not thus peculiar to a naturalistic and objective subject matter, the necessity of selected parts of natural sciences to direct preparation for life makes it possible to utilize its training. The new movement is wrong in compelling selection from *among* the natural sciences as wholes.

Selection must be made from *within* them. Perhaps all the natural science that is most essential to life in

general, both in its many-sidedness and frequency of recurrence, can be taught in and below the high school. The so-called courses in "general" or "elementary" science that have recently been successfully introduced into the high schools of Pittsburgh and elsewhere are planned from this point of view. The old physical geography courses were equally composite without ensuring the same many-sided relation to every-day life. More than this, the general science is experimental and disciplinary in place of being merely informational. Through laboratory work the pupils are both directly prepared for life and given invaluable sense training and a form of mental and manual development which, while involved in other phases of direct preparation for life, is thus strongly supplemented and re-enforced. Thomas Hill believed that enough of this sort of instruction can be given in the elementary and high schools to leave natural science in the college and university entirely to the specialist.<sup>63</sup> Both the abundance of naturalistic subject matter and the desirability of continuity in the material of instruction make it probable that he is wrong. If he is, it is likely that when the test of comparative worth, both from the standpoint of direct preparation and of formal development, is pedagogically applied, it will be found that a similar selection of more advanced subject matter than is within the ready comprehension of the ordinary high school pupil, to which, however, the general science of the high school has been preparatory, will be far more useful than the study of one or two pure sciences as wholes. In any event, the proposed status of natural science in the college is inconsistent. If students are permitted to elect *any* two natural sciences to meet the requirement, why, from the disciplinary point of view, not one in place of two? Except from the standpoint of direct preparation or specialization, one taught through a longer term of years than is probable with two, will ensure a more certain specific discipline. In any event, the likelihood of the general application of the resulting habits is in proportion to the

**The college course should include a variety of material taken from the several sciences.**

extent to which a subject matter naturally allied to every-day life is still more many-sidedly connected with it through instruction.

14. *Increased Contribution to Required Subject Matter from the Subjects Rich in Humanistic Content*

Perhaps the most dramatic result of analytic investigation of formal self-activity is the reversal of the relative place in the curriculum held by literature, history, sociology, civics, and economics as compared with mathematics and the languages. The latter become electives; it is highly probable that when the proposed test of comparative worth is applied, the former will each furnish so large a portion of the required subject matter as to become required subjects. Each of these subjects is so broad in its content that the college course, after either furnishing or taking for granted its general organization, necessarily selects here and there specialized phases. Direct preparation demands that whether this specialization is of period or of topic, it shall include all directly useful details that are essential, in the relationships and the form which most certainly and most potently further right living, good health, general industrial efficiency, social service, and good citizenship as well as avocation. Selection which disregards this for a vain effort at exhaustive representation and organization, passes into the territory of academic, scientific, or vocational specialization.

15. *The Use of Selected Portions of Academic Branches No Menace to Discipline*

At first thought the academic specialist sees in the partial use of his subject matter on the basis of its direct usefulness nothing less than the destruction of its system and the loss of the resulting discipline. His aim is completeness, both in inclusiveness of subject matter and in degree of organization. To be sure, under the influence of culture-epoch, biology, and genetic psychology he has attempted to adapt his elementary text-books to the pupils of the age for which they are intended,



but his aim has never ceased to be as complete a treatment as is within the comprehension of the pupils and as the time he can secure in the course of study permits. His attitude of mind is that of the pure scientist, not that of the teacher. Completeness is essential to the advancement of science through the specialist, and to the spiritual inheritance which each generation must pass on to the next. It is not essential to instruction, either through direct preparation or the resulting phases of formal self-activity. It is, however, mainly from this latter viewpoint that the specialist has sought to so far as possible present his subject as a logical and scientific whole. It must contain as many details as adaptation permits, but, above all, they must be so selected as to secure the completeness of organization which has been assumed to be necessary to discipline. That is, even in the exact sciences there has been partial presentation of the branches. But however bare of illustrative material and the material essential to adequate application the textbook may be, it must cover the entire range of the specialty and present it as an entire though abstract and attenuated whole.

**The aim of the specialist a completeness often hostile to interest and discipline.**

The result has been admittedly unsatisfactory, especially from the disciplinary point of view. Pupils are not thorough in mathematics or the languages. They are not interested in history and literature. The remedy is obviously concentration, but why on one or two branches as wholes? It is possible at the expense of many-sidedness to require sufficient time in the school course for the complete mastery of arithmetic, algebra, and geometry, and two languages for every pupil who under that inexorable condition will continue in school. The procrustean classical course, against which such lovers of the classics as Sydney Smith<sup>64</sup> and Thomas Arnold revolted, accomplished this. But the result is at best a highly limited specific discipline for the survivors, hostile not only to many-sidedness, but to both the direct preparation

**The remedy, selection within the various branches.**

and the general discipline to which it is an equally favorable condition. The alternative is concentration within the branch through a still more partial selection from its subject matter. This, obviously desirable from the standpoint of specific discipline, in so far as specific discipline is not dependent upon the mastery of the organization of the branch as a whole, makes possible the selection of the parts most certainly and specifically useful from the standpoint of direct preparation, furthers many-sidedness and general discipline, and even renders judicious specialization more probable by making the first step taken in every field practical, interesting, and sure.

16. *The Partial Subject Matter Selected Can Usually Be Organized from the Standpoint of the Academic Subject, as Well as from that of Direct Preparation*

And even specific discipline is not dependent upon the mastery of the branches as wholes. Selection from the standpoint of direct preparation will ensure in many respects a different content for certain of the branches, but unless a subject is almost wholly lacking in what directly prepares for life, the subject matter can be organized from the standpoint of the specialty as well as from the standpoint of direct preparation. Indeed, in most cases the organization peculiar to the special branch not only is as possible through its directly useful parts as through the specialty as a whole, but is as essential to direct preparation as to formal self-activity. Judged by the many-sidedness and frequency of recurrence which have already been seen to be the basis for selection, the general sequences of ideas and actions in time and space characteristic of general history, geography, and literature will be found to be indispensable, while the selection of directly useful details results both in the topical study of citizenship, industry, and morals throughout all times, lands, and literatures, as well as throughout the more intensive treatments of particular periods, countries, or writers in which such details may exceptionally abound.

On the other hand, it is easy to demonstrate that the thorough mastery of a part of arithmetic or geometry, or of selected facts and principles from a group of sciences, can be made specifically disciplinary from the standpoint of the specialty. One set of experiments will serve as well as another to develop the habits essential in scientific investigation. The arithmetical discipline which, as Professor Schwatt urged, can be as well developed through a more complete study of number as through higher mathematics,<sup>10</sup> can be even better developed through the complete mastery of selected arithmetical operations or practical operations selected from the whole range of number. The foreign languages alone, since their peculiar usefulness is instrumental, cannot be usefully taught in part except from the standpoint of etymology. Incidentally, however, it is interesting to call to mind even here Thomas Hill's final argument for the teaching of the languages from a disciplinary point of view: "But the most valuable part of the study of words does not consist in acquiring that intimate familiarity with any one foreign language which will enable one to write or speak it, nor does it consist solely in the intellectual exercise of learning to read it, and the intellectual vigor thereby produced. It consists rather in rising, by the study of particular examples, to a perception of some general laws of thought and laws of articulation," for the attainment of which, "a moderate acquaintance with four or five languages is better than a thorough acquaintance with one or two."

In concluding this brief review of the probable consequences of readjustment, if, in the spirit of the old Athenian, we follow the argument whithersoever it may lead, two fundamental and controlling facts must be held in mind. The first is, that direct preparation for life in general itself demands as adequate specific discipline as can be made possible by concentration upon any of the old "formal" subjects; and the second, that direct instruction prepares the way for and at every point strengthens the specialization which should parallel it throughout the entire course of education.

## CHAPTER V

### THE INTERDEPENDENCE OF CULTURE AND DIRECT PREPARATION FOR LIFE

BUT however convincingly analysis may demonstrate the indispensability of direct preparation for life to formal self-activity, it is when it is brought to bear upon the relationship of both direct preparation and formal self-activity to culture that the result seems most radical. It is especially important for some of us to discern that what is commonly called culture is not a distinct form of self-activity, as assumed by W. H. Payne and others, but rather an attitude of mind or apperceptive state far more largely dependent upon impression than upon discipline. This is especially true of the traditional culture, something which to be a gentleman one must at least have forgotten and which one is likely to forget because it is based upon knowledge unrelated to every-day life. The fact that it is so unrelated, that its concepts and activities are not more or less definitely associated with what is most certain to recur in ordinary experience, tends to remove it from the domain of discipline to that of remembrance and impression, from the domain of the specific to that of the vague, the intangible and the relatively useless—not utterly useless because it is vague and intangible, but relatively useless because it is not related to life. It is in protest against such a culture that Emerson exclaims: "Poetry and prudence should be coincident. Poets should be law-givers, that is, the boldest lyric inspiration should not elude and insult, but should announce and lead the civil code and the day's work."

### 1. *Culture Itself a Partial Phase of Direct Preparation for Life*

Indeed, culture is itself a phase of preparation for life, but a phase from which old Greek tradition has tended to exclude the worker. Historically considered, it is not only preparation for a leisure which the mass of workers cannot share, but through a kind of education which the mass of workers cannot hope to attain. It has not been partial preparation for leisure regarded merely as a part of life, but for a life of leisure. It is this that led Benjamin Rush, when he came to believe that "the business of education has acquired a new complexion by the independence of our country,"<sup>66</sup> to argue against the study of Latin and Greek as unsuited to democracy, not that it failed to provide examples of illustrious citizenship, but that it set aside those who mastered it as an educated class too often made arrogant through a peculiar learning.<sup>19</sup> Today when democracy is triumphant, when leisure is playing a constantly increasing part in the life of the mass, when a far more many-sided learning is accessible through the vernacular than inspired the Renaissance through the Latin and Greek, it is high time to analyze culture into its essential conditions and factors in order to discover what part of it, if any, is involved in other phases of direct preparation for life, and to what extent, if to any, preparation for other phases of life is antagonistic to it.

### 2. *The Essential Factors in Culture*

In the first place, while culture is liberal in the sense of being distinct from work, it does not of necessity include all knowledge that is not vocational. Pure science is distinct from science applied in work and may constitute a part of culture, but the specialist in pure science is not necessarily a man of culture, and a man of culture does not necessarily possess an intensive knowledge of pure science. The subject matter of culture must be liberal, but, except that it must

include what is essential to the development of æsthetic appreciation, the only additional requirements are that it must be many-sided and that it must be the common possession either of the whole educated leisure class or of a social group within it. It is both from the standpoint of many-sidedness and the use of culture in social intercourse that the specialist in pure science may fail to be a man of culture. In fact, an unrestricted elective system with its subjective specialization, and the group elective with its specialization, whether academic or vocational, are equally hostile to culture if instead of paralleling a liberal content required in common of all, they are permitted to take its place. With all of their many-sidedness, the pedant with the knowledge that he fails to put to use, the man of science absorbed in the advancement of learning, and the worker learned in all that contributes to his specialty, may still lack the essential elements of culture. The many-sidedness must not mean mere information or applied knowledge, but many-sided social contact through a common knowledge and a common intellectual and emotional experience in which the æsthetic plays conspicuous part. So necessary to it is this social quality, that culture must include the politeness and civility which are the outward expression of the understanding and the sympathy in taste and in thought which many-sidedness of knowledge makes possible but does not ensure. It would be possible even to conceive of a Bernard Shaw possessing the form of culture, but lacking its spirit, a superman, contemptuous of his fellows because the knowledge and experience which should make him comprehend and love humanity have only made him a man apart. The Philistine may know what the man of culture knows, but he does not appreciate what he appreciates or love what he loves.

### 3. *Modern Culture So Extensive as to Make Necessary Selection and Specialization in Culture Itself*

At the beginning of the Renaissance, many-sidedness was impossible without knowledge of the Greek and the Latin

tongues. They not only contained what was universal in thought, but expressed and inspired what was universal in literature and art. The early humanists were a noble but arrogant band—an intellectual aristocracy. The fact that the masses were debarred from their intellectual fellowship because the vernacular was unfitted for scholarly use did not trouble their minds. “The custom or convenience of ten thousand hinds,” argues Floridas, “is not to be weighed against those of a single man of learning.”<sup>67</sup> Sir Thomas More alone, Christian as well as humanist, dared to dream of a Utopia where all men should have leisure to live according to the direction of reason and where reading was made the chief avocation of the masses because they had “all their learning in their own tongue which is both a copious and a pleasant language in which a man can fully express his mind.”<sup>68</sup> Gradually the vernaculars of modern Europe not only were made “copious and pleasant,” but came to have noble literatures of their own, and to include through translation what is best not only in the Latin and the Greek, but in any other tongue which has become the medium of culture.

**Culture once possible only through Greek and Latin, with leisure confined to the few.**

By the beginning of the nineteenth century, with its marvellous expansion of the boundaries of human knowledge, its exploration and travel, scientific discovery, industrial inventions, commercial development, political revolution and social reform, culture could not only be found outside the ancient languages, but could not fully be found within them. More than this, the humanistic content has become too broad for all educated men to possess it in common. Hence the elective system within a liberal education, the study of branches in part, and academic specialization which may either be a part of culture or hostile to it. That is, it has become possible to specialize in culture as in discipline or vocation.

In a succession of simpler civilizations the culture of one age or epoch has given way to that of the next. In complex

**Culture now so broad as to permit specialization within it.** modern civilization various cults exist side by side—the classical, the literary, the artistic, and even the Browning, Shakesperian, or Wagnerian. The new Amherst and Dean West's Graduate School would represent specialization in culture as certainly as Massachusetts' School of Agriculture or Boston School of Technology represents specialization in vocation.

#### 4. *Specialization in Culture Must be Preceded by a Culture Common to All Educated Individuals*

However, just as specialization from the standpoint of discipline or vocation must be paralleled and preceded by direct preparation for life in general, so specialization in culture must be preceded by a culture which is common to all cults. The thorough man of culture must be a lover of the beautiful in all of its general forms. He must possess a cultivated and discriminating taste for literature, music, painting, sculpture, architecture. He must enjoy æsthetically and ethically as well as physically what is beautiful in nature—"the flower in the crannied wall" or the sunrise in the Alps. He must love learning for the sake of learning as well as for its direct usefulness to man. He must appreciate each æsthetic and intellectual field, but in some form or other, rather than in all forms or the same forms. Some will enjoy one novelist and not another; others, essays or poetry rather than fiction; some, oratorios; some, grand operas; others, ballads or symphonies. But all must acquire as common an æsthetic appreciation of every form of art and all that is great in mind or beautiful in nature as innate tendencies permit.

#### 5. *Culture Must Not Antagonize, but Further Other Phases of the Educational Aim*

Neither this common and required culture nor the culture that is specialized should contain anything hostile to the "half truths of service." On the contrary, what makes for the right enjoyment of leisure is subordinate to what makes



for healthful and ethical living, and should further industrial efficiency, good citizenship, and social service. Aristophanes and his fellow Athenians were right in struggling against the philosophy of Socrates and of Plato, which led the young Greek to exclaim with Alcibiades, "He makes me confess that I ought not to live as I do, neglecting the wants of my own soul, and busying myself with the concerns of the Athenians." While all can readily agree with Dean Riley, of Bryn Mawr, when she insists that on the whole the liberal education of today tends in the direction of good citizenship, Justice Hughes, in his Yale address, shows clearly the need of direct training for civic service; while Mr. Roosevelt sees, even in the classical reaction at Amherst, an exceptional opportunity to teach political ideals.<sup>18</sup> It is not enough to say that everything hostile to citizenship shall be omitted from modern culture; in the selection of its subject matter all that directly makes for citizenship in any high degree must be included. It is none the less cultural because its emotional form makes it potent for good.

**Culture must be related to citizenship, vocation, and all other phases of direct preparation.**

From this point of view, however, the greatest wrong done modern education by the domination of its culture by ancient ideals has been through the assumption that ideas and activities related to vocation are rendered illiberal if they are also associated with work. To the traditional thinker vocational culture is inconceivable. Culture must not only prepare for leisure, but must be disassociated with work. While many phases of culture have no connection with work at all, wherever such connection can be established, avocation, the calling of the mind away from every-day routine, is most readily brought about. The more certainly and permanently a thousand lines of interest and points of contact relate culture to life in general or even put otherwise remote and many-sided material to vocational use, the more certainly and permanently will the worker come into possession of the broader life which he can share with those whose initial inter-

ests in a common knowledge and emotional experience differ from his own. The essential thing to culture fitted to a democracy is not that it shall have no utilitarian relationships or be taught in relationships which are not utilitarian, but that, wherever possible, it shall have relationships which are utilitarian in the most many-sided way. It must not have but a single door to be reached through some steep and secret path, but a thousand doors through any one of which the seeker after knowledge may enter, and through all of which he will at times depart.

But to connect the æsthetic and the many-sided with work and even with wage earning does not mean that its relationships must be exclusively or even predominantly vocational. There must be direct preparation for leisure distinct from preparation for work and potent enough to develop a liberal attitude of mind. The significant fact is that culture and direct preparation for phases of life other than leisure have in common many-sided ideas and activities—some of them æsthetic—which can be directly related to each.

From it two important consequences follow: First, that vocation can be liberalized without losing its efficiency, and that culture can be related to the "half-truth" of service without losing its freedom. Second, that culture and other phases of direct preparation overlap. That is, discipline, specialization, and the various phases of direct preparation, including culture, require a many-sidedness that is in part identical. Democracy demands a culture which, made common to all citizens through its many-sided interrelationship with direct preparation for life, shall not be displaced at any stage of the educational process by specialization, whether

**The re-  
lating of  
culture to  
vocation  
essential to  
democracy.**

in vocation or in culture itself. It must precede and accompany each. To it a vocational training that ignores the common culture, and a cultural training which displaces it, are equally hostile. Dr. Gilbert has performed important public service in pointing out again and again the menace to American institutions which lies in a speciali-

zation in elementary education that prevents this common culture.<sup>69</sup> So has Professor Hanus, who, with all of his championship of vocational courses in high schools, insists that they shall be given in the same building and center about a common arts and science course.<sup>70</sup>

6. *A General Culture Related to Vocation Should Parallel All Vocational Specialization, and Direct Preparation, All Specialization in Culture*

The most critical situation lies in the higher education with its specialization in culture versus specialization in vocation. If the vocational specialist is insistent upon culture at all, it is that it must precede rather than accompany specialization. A four-year college course, for example, is required for entrance to the stronger colleges of law or of medicine. Finance and commerce show a better tendency in insisting upon the paralleling of technical courses with liberal study.<sup>71</sup> Indeed, the practice of certain universities in allowing a certain amount of professional specialization within the arts and science course itself, gives the lead that points to the solution of the problem. Just as certainly as culture is a growth, should specialization be a slow development throughout a long term of years. Continuity is favorable to each. Through it habits and attitudes of mind are made certain, one being added to another until a sure system of ideas and activities results. Four years of pure arts and science work may create a distaste for vocation, while four years of exclusively technical work may mean arrested development if not atrophy in culture. The assumption that the cultural and the vocational are mutually exclusive in education is absurd. If they cannot co-exist in education, how can they co-exist in life itself, of which education, after all, is but a part. The real antagonism is between a culture remote from life, which despises work, and a vocational training which has no time for culture. Culture, like every other phase of direct

Both culture and specialization demand continuity.

preparation for life, should at each stage of education parallel specialization and be paralleled by it.

Even after the common culture has been attained, specialization in culture must not be hostile either to it or to any other phase of direct preparation. Direct preparation demands continuity as persistent as that demanded by culture and specialization, and so must parallel specialization in culture as certainly as both culture and direct preparation must parallel specialization in vocation. The graduate school or the college which specializes in culture should and will create the love for pure science, whose sacred vocation it will be to pass on and to advance the learning which it inherits; it can, but it must not, produce the pedant. It should and will produce a love of what is beautiful in nature and mankind; it can, but must not, produce a sensualist or voluptuary. It should and will produce a more spiritual citizenship; it can, but it must not, produce the man without a country who withdraws himself "from the madness of the multitude," because "there is no one who ever acts honestly in the administration of the state, nor any helper who will save any one who maintains the cause of the just."

Direct preparation also demands continuity and must parallel all specialization in culture.

### 7. *The Obstacle to Common and Democratic Culture Which Lies in the Attempt to Develop Artistic Expression at the Expense of Aesthetic Appreciation*

Now that the great mass of individuals have a constantly increasing amount of leisure and rapidly multiplying means for its cultured enjoyment, perhaps the most serious obstacle to a democratic and common culture lies in insistence upon specific phases of culture that are democratic in the sense of being accessible to all, but undemocratic because all have not the capacity to attain them. This, of course, does not apply to many-sidedness in general, but to its æsthetic manifestations. Nor does it apply to the unfortunate limit to æsthetic appreciation imposed by such physical or mental

defects as color-blindness or inability to discriminate the ordinary gradations in musical sound. It rather consists in substituting for the development of an æsthetic appreciation possible to all normally constituted human beings the vain attempt to develop in all the artistic expression possible only to the few. The limit to effort to develop expression through the fine arts lies in interference with the development of æsthetic appreciation. Artistic expression is a form of specialization more unessential to general culture than are mathematics and the foreign languages to general discipline. It is possible to the many only in the form of loving familiarity with the art of the master who interprets for all what he alone can express. That is, it can be a part of a common culture only in the sense of an æsthetic appreciation which may in itself be a truer and a deeper self-expression than is possible to the mass of us through artistic training. It is a double menace to democracy itself when the promotion of pupils to a higher grade in the public school system or admission to college is dependent upon either some form of artistic expression, which excludes many as incapable, or of a crude artistic appreciation which may be developed at the expense of æsthetic enjoyment. It is undemocratic in preventing pupils from being advanced for the sake of what can be left for the specialist without prejudice to culture. It is undemocratic in excluding or limiting the common culture possible to all. In the elementary school a saving common sense has prevented the requirement of such forms of artistic self expression as drawing, music, and literary composition as conditional to promotion. They are customarily not regarded as "grading subjects," and pupils proficient in other branches are advanced regardless of their success or failure in them. They are undemocratic only in devoting to a hopeless effort to develop a common artistic expression, the time that can be successfully used for the development of a common æsthetic appreciation.

To make  
promotion  
dependent  
upon  
artistic skill  
doubly un-  
democratic.

In the secondary school, however, the required work in

English fixed by uniform college entrance requirements has been emphasizing the analytic study of a few masterpieces of literature with a view to comprehension of literary technique and the development of artistic criticism. Granting that it is within the capacity of the majority of pupils, it is, if not an unessential phase of culture, a barren substitute for the æsthetic appreciation from which it is distinct and to which it is more or less antagonistic. If one or the other is to be sacrificed, it is guidance in the reading of literature in all of its many-sidedness that should be required, and the intensive and technical study of specific writers that should be omitted or left to specialization. While the saner attitude of certain colleges and universities in making their only requirement for admission facility in the use of written English, if it does not involve more than simple and grammatical composition, is a step toward democracy in the sense of accessibility of the upper high school grades and the college to all pupils, it is a step away from democracy in the sense of a common culture. The broad reading of good literature should be required, with due regard to individual tendencies and capacities. Dr. Harris had in mind not only democracy from the standpoint of accessibility, but also from the necessity for this common culture, when in 1894 he urged that the raising of the standard of admission to college was a "national disaster in education" which would prevent the leaders who mold public action, especially "the poets and literary men," from entering college through the public school.<sup>72</sup>

As in the case of music and of art, the main criticism that can be made of the present requirements of the elementary school course in literature is that the time vainly devoted to artistic expression can be more profitably given to æsthetic appreciation. Ordinary work in English composition, the mechanical drawing possible and useful to all, concert singing which does not involve reading by note,

**Democracy demands grammatical speech and a common love of good literature.**

**Discovery of genius practicable through the little art work essential for all.**

though included in the course of study on other than cultural grounds, afford ample opportunity for the discovery of individuals capable of specialization in the fine arts. From the earliest years of the public school course provision for such specialization should be made, not alone through the schools of design and industrial art already provided in the great cities, but where specialized instruction in elocution, instrumental and vocal music, drawing, painting, and sculpture, cannot be given as an integral phase of public school instruction, through public scholarships in private institutions and the formal recognition of such private instruction as part of the regular work of the school. In the great cities scholarships have already become common, but the recognition by the high school in Berkeley, California, and Chelsea, Massachusetts, of private instruction in music whose quality has been approved by school authority as one of the units necessary to graduation, is a pioneer step toward the encouragement of a specialization in art that in no wise need interfere with school work essential to all.<sup>13</sup> Where specialization cannot be carried on within the school, the least that the school can do is to prevent overwork by substituting it for some optional or elective subject which the school provides. In the majority of high schools outside the cities this will become practicable only through consolidation brought about through the co-operation of neighboring districts, now generally permitted by state law. In the elementary school it will be a part of the modified course of study that scientific research and enlightened public opinion will soon compel.

8. *The Rapid Multiplication of Means Through Which a Common Aesthetic Appreciation can be Readily Developed*

For these necessary readjustments the training of æsthetic appreciation need not wait. The development of a sense of appreciation for the beautiful in painting and sculpture, personal dress, home decoration, and architecture can well take most of the time hopelessly devoted to self-expression through brush and pencil. Already marvellously well done

in such schools as the William Penn High School for Girls in Philadelphia, and the Trade Schools for Girls in Boston and New York City, such training as a means to happiness is an inalienable right of every child in the republic. It is such instruction, and not drawing, as urged by Dr. Harris in an address before the National Education Association in 1889, that is the essential condition to artistic production by American industries.<sup>73</sup> There is an ample supply of designers who can produce artistic as well as inartistic designs, the same skill in drawing being necessary to each. Indeed, in the more expensive products artistic designs are abundant. They have been largely lacking in the cheaper articles because there is little demand for them. Glaring color combinations, inartistic lamps and vases, gaudy dress goods, and impossible chromos are made—like the razors immortalized in Goldsmith's verse,—because they are easy "to sell." It is not instruction in drawing, but the development of a truer sense of æsthetic appreciation in the masses, that will ultimately raise the artistic standards of American industry.

Artistic material for such instruction is abundant. Reproductions of masterpieces of painting and sculpture, illustrations in the standard periodicals, stereographs, delicately tinted tissue papers for color combination in neckties, dress designing and hat trimming, specimens of ornaments, utensils and furnishings having the right lines and coloring, all are easily obtainable. Traveling and loan collections, together with co-operation from local artists, collectors, and manufacturers, can greatly facilitate the work. To crown all, the school must use the moving picture machine as a means to the reproduction of what is most beautiful in motion, whether in nature, the drama, or every-day life. Architecture in a natural and human setting that makes it a thing alive, waves breaking upon a far-off shore, a mountain covered with a forest of rustling leaves, a minaretted mosque with its white-robed worshippers, a scene from Rip Van Winkle or Oberam-

More general æsthetic appreciation, rather than ability to draw, essential to artistic production.



mergau, unite to make it a veritable kaleidoscope of art. When, for the love of amusement and art, the very nation is beginning to go to school, the school through formal instruction should play its part.

While all this is true in the field of form and color, it is no exaggeration to say that in the field of music the phonograph and the pianola are doing all that the printing-press has done for literature. When all forms of music are more accessible to every individual and to every home than literature itself, is it not time for the school to add to the rote-work which teaches

Love of music independent of reading by note.

mediocre singers how to read by note the development of a love for what has become immortal in music and in song? Reading by note is merely a favorable condition to singing, not necessarily to good singing, but to any kind of singing, especially to part singing in chorus. It encourages a form of avocation which may or may not be cultural, but which gives physical pleasure to an individual or a group and æsthetic enjoyment if not to an open-windowed neighborhood, at least to an appreciative home. My voice or my piano playing may be a "poor thing, but it is my own." The French critic, who not

long ago protested against instrumental music in the public schools on the ground of the discomfort which the music of the ordinary home gives to cultured ears which happen to be within hearing, ignores the refining influence which even such music has upon ordinary family life, and the wholesome and happy avocation which it affords

Even mediocre singing useful for avocation and the development of taste.

to the singer or performer himself. It is good for the village blacksmith to hear his daughter's voice and it is good for the daughter to sing. It is a phase of avocation quite distinct from culture, but, far from being a menace to it, may aid in developing it. We are happily unconscious of our own æsthetic lacks on the side of expression, and do not hear ourselves as others hear us, any more than we can "see ourselves as others see us." Our interest in our own poor music, however, may be the step by which we rise to a love of truer melody.

On the other hand, the very effort to attain a higher musical level may be made at the expense of avocation in the home, if it takes the form of the cultivation of artistic expression in place of a gradual refinement of æsthetic taste. Where practice is substituted for the performance which helped make home life enjoyable, specialization, even though purely artistic and the vestibule to culture and social popularity, may be bought too dear. Singing by note, however artistic the specialization to which it occasionally may lead, must not interfere with or exclude the training which is intended to develop a true musical taste. Bad music is the most contagious of æsthetic diseases. We may not read at all; we may be blind to painting and to sculpture, good and bad alike, but we are bound to hum or whistle the newest song. Ragtime drifts into the singing book of the Sunday-school. It has taken the wise censorship of the pope himself to preserve the nobility and the dignity of the music of the church.

Into this dead level of mediocrity and degeneration comes the Melba or Caruso record, oratorios, symphony, and grand opera; folk song and ballad are brought to the home that otherwise would hear the music of the street or the variety show. Ready to murder some thing of beauty, tempted by the allurements of some sensuous song, we have heard Pippa sing.

The school must utilize and direct this new force in education. In Dayton, Ohio, for several years phonographs have been in successful use in the schools, the records that are purchased or borrowed first being approved by the school authorities. The manufacturers themselves have recently taken up the matter, and employed an expert supervisor of school music to plan ways and means of introducing phonographs into the schools. There is no reason why public school children, who, from their earliest years are familiar with what is most beautiful in vocal and instrumental music, should not gradually come to see the crudities and the

Indeed,  
artistic skill  
may be de-  
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of avocation.

The phono-  
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vulgarity of the songs that now tickle the popular ear. In 1908, with the assistance of the Combe's Conservatory of Music, the children in each grade in the School of Observation, conducted by the Department of Pedagogy in the Summer School of the University of Pennsylvania, were taught to associate the name of composition and composer with a number of the most striking and characteristic themes from great masterpieces. Twelve such selections, as Rubenstein's Melody in F and the Sextette from Lucia, were readily recognized by the majority of the pupils after the presentation of one or two of them five or ten minutes each day for a period of six weeks. If the choicest musical compositions are not only continuously presented through school and college, but, like ideas, are given the better chance of being remembered and recalled, that comes with fixed association with a name; if such instruction is supplemented when possible with visits to musicals, symphony concerts, oratorios, and grand opera, or, more rarely, the visits of great singers or instrumentalists to the schools; if, as is rapidly coming to be the case, the children are themselves led to sing the ballads and folk songs urged by Dr. Hall, national airs, and all else that is truest and best, there is small danger that rote song and mechanical drill can make music uninteresting or that the national taste will become or remain corrupt.

In higher education such taste should be made more critical, or at least more intelligent, through knowledge of the history of music and of art. The old dominance of the intellectually formal is responsible for the fact that, with all the emphasis given in the college to culture through literature, culture through music and art is not required.

**Requirement of the history of music and art in college.**

At no stage, however, must instruction forget the distinction between a common æsthetic appreciation and a specialized artistic expression, or even artistic appreciation in the sense of comprehension of musical technique. A too highly cultivated taste may rob one of much of the joy of living. Æsthetic appreciation gives pleasure unalloyed, but,

like every other emotion, is decreased when intellectual judgment is brought to bear upon it. Indeed, artistic appreciation not only involves an intellectual activity which serves as a check upon æsthetic enjoyment, but, being in itself pleasurable, produces a feeling or emotion that is distinct from the æsthetic and tends to take its place. The "baseball fan," so familiar with technique as to be supersensitive to error, is the most popular example of artistic appreciation carried too far. The man who understands the game enough to know how it is being won enjoys himself as a sportsman, and not through a form of appreciation as professional as the play itself. Artistic appreciation in the fine arts, reaching its highest development in artistic criticism, too often produces a feeling of self-confidence and pride little likely to be æsthetic. At best, it is a phase of specialization in culture; at its worst, it is too technical to be cultural at all.

The general course in the fine arts in high school and college, whether in literature, music, painting, or sculpture, is little likely to produce art critics. It should add, however, a wealth of discriminations and associations to the earlier and simpler æsthetic pleasure which every student should have come to possess in art. Unlike the artistic criticism which, being immediate upon artistic presentation, is likely to take the place of other feeling, these associations follow after the more immediate pleasures of æsthetic experience, and make them more enduring through mutual relationships in the common culture of which both feelings and associations are a part.

**Definiteness makes æsthetic experience systematic, cumulative and enduring.**

9. *Instruction in Æsthetics Should Be Separate and Distinct from Other Phases of Instruction Which Interfere with It*

Elementary school work in reading and literature exemplifies a secondary obstacle to æsthetic appreciation, closely allied to interference through specialization, yet distinct from it—interference through other phases of instruction. Mechanical mastery of written language, comprehension of

the thought of the writer, its vocal expression through oral reading and written composition, æsthetic appreciation of form of expression, and artistic appreciation due to a comprehension of rhetorical technique, are all separate and distinct, though complementary aims, to be realized through separate and distinct means that may at times conflict. Mechanical reading and writing, comprehension of a writer's meaning, ability to grammatically express one's own in ordinary composition, even judgment of artistic technique must be required of all pupils, but not in the sense of exacting a common standard for all. All must be able to sound out any word, and, if it is unfamiliar, to determine its meaning from the dictionary; all must be able to write any word with some degree of legibility and readiness; all must be trained to avoid the common errors of colloquial speech, and to at least identify the figures of speech and other forms of language which characterize a writer's style. But some pupils can never be skilled penmen; others will never read aloud in a way that will give pleasure to others; while educational experimentation and research have not yet determined whether the mass of American children living in an ungrammatical environment can be made grammatical through such persistent repetition as is possible in school of correct forms alternative to common blunders in speech.

**The various aims of language work mutually conflicting.**

Artistic and literary self-expression, whether in the form of public reading and declamation, or of composition other than the emotional forms essential to all, belongs to specialization. The attempt to develop it must neither be required of all, nor carried so far with any but the specialist, as to sacrifice appreciation.

On the other hand, all pupils can be taught to appreciate good literature æsthetically if it is impressively presented in sufficient variety, and other essential phases of language work are not allowed to conflict with it. The earliest obstacle to its development lies in failure to present the masterpieces of literature in the elementary school with sufficient elocu-

tionary or dramatic effect for them to be enjoyed. It is a question whether any literary masterpiece can be read and re-read around the class by pupils deficient, not only in the vocal training necessary to pleasurable self-expression, but in the very mechanics of reading, without a feeling of distaste being engendered which is hostile to the development of appreciation of literary form, even where the subject matter is understood and presented with sufficient continuity to have interest through its meaning. It is at least safe to say that the impressive reading of masterpieces to the children by either the teacher or one especially well qualified to read them sympathetically and expressively can and should precede and parallel mechanical drill; that, where masterpieces are to be drilled upon, they should first be so presented; that much which is beautiful should be read to the children before they can sympathetically read it for themselves, and that much shall be so read which they will neither be called upon to read nor to write about. The effective work now being accomplished by the Junior Drama League under the inspiring lead of Miss Patton, together with the increasing popularity of "dramatization" in the ordinary reading work of the elementary school, is tending to the same end.

A second obstacle to the development of æsthetic appreciation lies in a juvenilizing of literature which robs it of its literary form in order that it shall be fully comprehended. The objection is not against the writing of books for children, which often have a literary charm of their own, but against the re-writing of masterpieces in language so modified that children can understand, with a consequent loss of literary form. Charles and Mary Lamb took the plot of a play and gave it literary form for children, just as Shakespeare put it into dramatic form for all. To read the plot of a play not only does not detract from it, but results in a clearer comprehension of the part played by each character. But to

**The first presentation of a literary masterpiece should be impressive.**

**The juvenilizing of literature hinders æsthetic appreciation.**

take literary masterpieces, in which the interest lies both in the interplay of characters and in the gradual development of the story as a whole, and through their simplification to rob the characters of the artistic details which make them alive, and to substitute the style of the school text-book for that which has made a great writer immortal, is to give full comprehension at too high a price. The interest in the adapted subject matter is often gained by a loss of future interest in its original. While, even from the standpoint of comprehension, full comprehension, through juvenilization, prevents the steady growth to intellectual maturity that is furthered through the partial mastery of a multitude of new terms, held in mind through interest in a great story, to whose comprehension as a whole they are non-essential, but in whose fuller comprehension even their partial understanding plays a necessary part. *Æsthetically regarded, they are the over-tones of literature. If children are to hear the masterpiece at all, it should be on the violincello or the grand piano, not on the penny pipe. Even if the harmonies of expression which constitute literary style were harmonies of sound alone, the children who constantly hear them develop an appreciative and discriminating ear for beauty in language, as Petrarch came to love the sonorous cadence of the Greek which as yet he could not understand.*

**Juvenilizing  
checks the  
develop-  
ment of  
vocabulary.**

As a matter of fact, however, the most certain way of amplifying vocabulary for children, as for the more mature, is by much reading, limited neither by ability in spelling nor ability to fully comprehend. This was the lesson taught in the discussion of mere remembrance as a means to apperception.

Matthew Arnold, who, more than any other, is responsible for the introduction of good literature into the elementary school, is primarily responsible for another phase of work hostile to culture—the concentration upon masterpieces as wholes which has become so common in the grammar grades. It is easy to sympathize with his impatience

over young Philistines who referred to Shakespeare as the writer of the judgment scene in the Merchant of Venice, but the remedy does not lie in giving half a school year to the Merchant of Venice or the Courtship of Miles Standish to the exclusion of dozens of interesting and representative extracts from great writers otherwise not represented in class work, but rather in encouraging or requiring pupils to follow up class work by individually reading as wholes the masterpieces whose parts interested them most. Indeed, Mr. Arnold himself strongly recommended the reading of a variety of shorter poems in preference to a lengthy masterpiece.<sup>74</sup> The many-sidedness necessary to culture must still be brought about for the majority of Americans, if brought about at all, in the elementary school. In music and the other fine arts, as well as in literature, continual and impressive presentation of what is most beautiful, not in the work of some one, but of all the masters, should be made at the stage of æsthetic development to which they are best adapted, both for the sake of many-sidedness and the encouragement of selection through individual interest, without which individual many-sidedness is impossible.

**Intensive study of masterpieces as wholes can be hostile to culture.**

10. *Both Direct Preparation and General Discipline, Being Conditioned by Emotional Form of Expression, Must Include a Part of the Content Most Useful for Culture*

What makes adequate emphasis of the æsthetic phase of culture more readily possible through the public school system is not only the fact that much cultural material can be related to other phases of direct preparation for life without menace to culture, but that, as already demonstrated, effective furtherance of both direct preparation and general discipline demands far greater emphasis than is now being given in the school to the emotional form of expression possible only through literature, music, and art. This means something more than the occasional inclusion of culture in various other phases of direct preparation. It is true that to love



mountains, seas, woods, and flowers, or the masterpieces of art and literature which a nation has produced, is an essential part of love of country, just as the artistic affectation which depreciates American art and slavishly imitates foreign modes is a weak form of treason. Similarly, the love of the beautiful in nature and of the good in art strengthens our love of the divine as surely as enjoyment of a realism that sings or paints the beauty of what is sensuous and base unconsciously unveils a soul that is partly lost. But if life's aims are to be fully realized, if the emotional centers necessary to useful discipline are to be developed, instruction must not only welcome these indirect contributions of culture, but must directly utilize all of its emotional forms as a means to cumulative impression. What inspiration must have come to the Greek boy as his religious faith, his national ideals, the standards of his social life, were taught him not through the adjurations of pedagogue or harp-master, but with the melody and power of ringing Homeric verse. "And when the boy has learned his letters, and is beginning to understand what is written, as before he understood only what was spoken, they put into his hands the works of great poets, which he reads at school; in these are contained many admonitions, and many tales and praises and encomiums of ancient famous men, which *he is required to learn by heart*, in order that he may imitate or emulate them and desire to become like them. And, when they have taught him the use of the lyre, they introduce him to the poems of other excellent poets, who are the lyric poets; and these they set to music, and make their harmonies and rhythms quite familiar to the children's souls, in order that they may learn to be more gentle and harmonious and rhythmical, and so more fitted for speech and action; for the life of man in every part has need of harmony and rhythm."<sup>75</sup> Reverence for God cannot be adequately taught from catechisms, or love of country from dry-as-dust text-books. A longing for social service will not spring from the most convincing statistics, or the joy of

The fine arts must further direct preparation and general discipline.

labor from discourses on morals and economics. Definiteness of creed requires the formal statement of divine attributes and patriotism, of the doctrine of equal rights, as general discipline demands the certain formulation of any other potent idea. But it is the poems of saints and of patriots, the rhapsodies of the prophets and orations of statesmen, the eloquent descriptions of mighty deeds, ballads, and oratorios, dramas and paintings, statues and cathedral spires, the æsthetic inheritance of the race, that form the man of spirit and inspire him to speech and to action. It is not through mere exercises in elocution, or the committing to memory of gems of literature, but in the association with the most useful ideas of the common feeling which springs from a cumulative mass of emotional material, that culture must be brought to bear. The most spiritual culture is not found in æsthetic leisure, but in the emotional furtherance of all that is noblest and truest in life.

### II. *Culture Not Only Included in Direct Preparation, but Dependent Upon It*

On its æsthetic side, then, as well as in its many-sidedness, culture has much in common with every other phase of direct preparation. The many-sidedness which furthers them furthers it, and many of the relationships peculiar to it are helpful to them. This identity of subject matter is even more apparent when it is analyzed from the standpoint of formal self-activity. Culture does not merely consist of an attitude of mind—the cumulative impressions of a college course. While æsthetic judgments and experiences are largely emotional, culture, in the broad sense, also includes mere remembrance, varying apperception, and specific and general discipline. And whether it is a steadily decreasing factor in individual life, or becomes a dominating force, depends upon the extent to which its fundamental relationships are made certain and permanent, and become the centers for constantly varying association and application. True culture is a

**Culture involves all phases of direct preparation.**

growth, not a vague but lingering recollection of the beautiful, and demands not appreciation only, but imagination and reflection. There is only partial justification for the old saying that there are certain things in education which a gentleman must have forgotten—a quip that possibly has its origin in the medieval distinction which led Montaigne's two travelers to insist that they were grammarian and logician. It was the scholar, and not the gentleman, who found it necessary to remember. The gentleman could forget his Greek and Latin after they had opened the door to a literature whose impressions would always linger in the heart and soul.

But modern culture at least includes definite and specific relationships which must continue to be held in mind, from grammatical speech—its first prerequisite on the social side—and certainty of information concerning not only individual masterpieces, but the fine arts, to the subtle distinctions and fixed tenets essential to æsthetic specialization.

Useful imagination, even though æsthetic, and reflection, though confined to the beautiful, are impossible without both the fixed relationships, which constitute a specific æsthetic discipline, and those which are included among the conditions favorable to its general application. An interrelation with other phases of direct preparation is, therefore, desirable for culture, for the sake of remembrance and continuity as well as of completeness of representation. The more culture is interrelated with direct preparation, the more complete and more enduring it will be, the more it will tend to dominate sensibility and action, both through common recurrence with what is itself most certain and enduring, and through the greater many-sidedness and surer general discipline to which definiteness and certainty are essential. It of necessity follows that the emphasis of direct preparation in the course of study found favorable to general discipline is also favorable to culture.

**Culture demands the continuity ensured through relationship to life.**

12. *The Study of Greek and Latin, Even from a Purely Cultural Viewpoint, Belongs to Specialization Rather than to General Education*

It must be granted that just as mathematics and the languages possess an advantage from the standpoint of specific discipline through the fact that their peculiar form of organization compels it, so the Greek and the Latin possess the advantage from the standpoint of culture, that they cannot be mastered—at least in their more advanced stages—without certainty of contact on the part of the student with the noblest forms of literature and art. Opposed to this is the failure of the great mass of Greek or Latin students to reach the cultural stage of study, the immense amount of time expended by those who do, and insistence by certain specialists upon the reading of artistic passages flagrant in the paganism and immorality dreaded by the early church fathers. The useful part of the classical content can be made just as certain of mastery, and far more accessible, without the study of the classical languages; while such parts of it as are pagan and immoral need not be included in the education of youth through contemptuous insistence upon an artistic whole. The contribution of Greece and Rome to universal culture will perform an increasingly important service in education as it finds its final and permanent place in each modern vernacular, as a part of the far broader whole which is required of all, in place of itself constituting a narrower whole requiring the mastery of languages which, in other ways, are useful only to the specialist, and render a higher cultural training impossible to the mass of advanced students. It is only as language study includes literature, and not, as Dr. Harris insisted, through “the effect of the mere language in its idioms and its grammatical structure,” that one is put “into the atmosphere of art, literature, and science.”<sup>76</sup> Idioms and grammar are not necessary to put

Classical culture made most general and useful through translation.

Classical forms not essential to art, literature, and science.

one "into the stern, self-sacrificing, political atmosphere of Rome." They are not necessary to the splendid examples to which Thomas Arnold points when he exclaims, "Aristotle, Plato, and Thucydides, and Cicero and Tacitus are most untruly called ancient writers. They are virtually our own countrymen and contemporaries, but have the advantage which is enjoyed by intelligent travelers, that their observation has been exercised in a field out of the reach of common men, and that, having thus seen in a manner with our eyes what we cannot see for ourselves, their conclusions are such as bear upon our own circumstances; while their information has all the charm of novelty, and all the value of a mass of new and particular facts, illustrative of the great science of the nature of civilized man."<sup>77</sup> It is doubtless this point of view that Mr. Roosevelt has in mind when he commends the new Amherst plan from the standpoint of citizenship. But if, as is not the case, the study of the Greek and the Latin languages should be necessary to give the viewpoint of ancient worthies, it would still remain "out of the reach of common men," and the most that could be said for it would be that the men who specialized in it would find much that interprets modern life.

Unessential to the majority of individuals, both for the attainment of the noblest contributions to culture and civilization, and from the standpoint of general discipline, the ancient languages, no longer required of the general student, become an increasingly precious charge upon the specialist. For such specialization the new Amherst would afford a highly favorable opportunity, and other institutions here and there throughout the country might well afford to follow the lead which the group of her alumni have suggested.

But from the standpoint of the general student, the present relationship of the classics and of ancient history must be reversed. In place of condensing ancient history in the high school to an intensive study of Greece and Rome, which all students who elect history are too frequently com-

**The relationship of the classics and of ancient history must be reversed.**

pelled to take for the sake of those who are to study the Greek or Latin languages, all students should be required to read good translations of those parts of ancient literature which throw the most light upon history and give to the most useful contributions of ancient peoples their highest emotional expression. Ancient literature, as a whole, cannot be related

**Failure of attempt to relate the classics as a whole to modern life.**

to modern life, and even the efforts of Thomas Arnold to so relate it resulted in absurd imitations by others. Mr. Quick, for example, represents one of his fellow-workers as asking of his pupils not only, "Is any modern expedition like Cæsar's? Are modern people like Britons? Are we Britons?" but "Which in the form is most so?" and "Is Napoleon III more nearly descended from Julius Cæsar, Cassivelaunus, Caractacus, or the Ubii?"

13. *The Material of Culture, Whether Ancient or Modern, Proved Most Useful By the Test of Relative Worth, Will Be Possible to All and Must Be Required of All*

The same many-sidedness of useful relationship, frequency of useful recurrence, and degree of useful sensation or emotion that test relationships in general, must form the basis for the selection of cultural material, whether ancient or modern. The result must be a common culture for the masses, which precedes specialization whether in vocation or in culture itself, and continues to parallel it at every stage of development. It must be a culture possible to all and required of all. Related as far as is practicable to every other phase of direct preparation, it will no longer, on the one hand, be hostile to technical training, and, on the other, fail to gain the certainty and continuity that its emotional furtherance of direct preparation will give.

14. *With Both Culture and General Discipline Assured through Direct Preparation, No Further Ground Remains for Excluding from Higher Education the Students Who Fail in the Old Formal Subjects*

Above all, with both culture and general discipline thus assured through direct preparation for life, no further ground remains for excluding from a higher education the pupils who fail in the old "formal" or "cultural" subjects. Common concentration for all students, upon a branch of mathematics and a language, is not a panacea for a defective mental training which either the science of education or republican institutions can permit. To exclude from high school or college young men and young women economically able to enter, through insistence upon subjects unrelated to direct preparation for life, and the assumption that individuals who fail to master them are not adapted for higher liberal training, is fatal both to individualism and democracy. It is fatal not only from the standpoint of the citizen, through preventing the exercise of an equal right to a higher education which, so far as economic conditions permit, should be as universal as elementary education itself, but from the standpoint of the state, through denying to the school the opportunity to, so far as possible, compel the more advanced direct training as essential to enlightened citizenship as to leadership. Under present economic conditions the state cannot make higher education compulsory, but it can refuse to permit any unnecessary obstacle to a form of individual betterment which so surely promotes its well-being. The high school and college do not exist merely for the training of leaders whose names may figure in some future "Who's Who in America?" and the measure of their usefulness lies but partially in the proportion of great names enrolled upon their alumni registers. No matter how unmathematical the mind that they attempt to discipline, no matter how reluctant the tongue to repeat the accents of

**Exclusion of mediocre students from advancement fatal both to individualism and democracy.**

**High school and college do not exist only for the training of leaders.**

other peoples, every useful relationship that is made certain and sure, every addition to many-sidedness of knowledge, every right impression that is re-enforced, even each partial retention and understanding of great thoughts—the relative failure at which the pedant jeers—tends to raise the general level of individual life and of the civilization to which it gives rise. When it is economically possible, each individual must have not only the vocational or specialized training for which he is individually most fit, but the more advanced stages of direct preparation for life in general that should be common to all fellow-citizens in community and republic. As Isocrates said of the training of the orator, “But as for those who are of a weaker genius, it will never render them adroit pleaders or great orators; but it will make them excel themselves, and become more prudent in many things.”<sup>78</sup>



## CHAPTER VI

### UNIFORMITY FOR VARIOUS LOCALITIES IN THE GENERAL COURSE OF STUDY LIMITED TO THE ESSENTIAL RE- LATIONSHIPS WHICH MUST BE CERTAINLY MEMORIZED

#### 1. *The Fundamental Nature of the Distinction Between Essential Relationships Which Must be Specifically and Permanently Memorized and the Optional Relationships Left to Individual Apperception*

In the light of present educational tendencies, and especially in view of the extreme reaction from mechanical memorizing, the fact most significant to formal self-activity, which resulted from its analysis, is the paramount importance of specific discipline. It is useful not only in itself, and as a means to useful remembrance and apperception, but pre-eminently both as the first stage of general discipline and among the conditions favorable to it. It is not less memorizing than was characteristic of the old education that is called for, but more. The distinction between the old and the new must not continue to be the distinction between discipline and varying apperception, but must come to be between the memorizing of facts as facts and the memorizing of essential relationships; between the devotion of all school time to the memorizing of far more than can be permanently retained, and the certain memorizing and retention of as much as is useful and possible, with time physiologically and psychologically limited. This physiological and psychological limit to the time that can be effectively spent in memorizing, and hence to the amount of subject matter that can be retained in definite and specific relationships, indicates the most fundamental pedagogic distinction, both for curric-

The paramount importance of specific discipline and, hence, of mechanical memorizing.

ulum and method. It is the distinction between specific relationships, relatively so useful that they must be made certain and permanent, and specific relationships perhaps little less useful, that cannot be repeated often enough to be made per-

manent. That is, determination of the relative usefulness of particular relationships, direct and indirect, is the only mode of determining which should be made specific and certain in the time effective for repetition, and which must remain variable and uncertain.

The test for determining relationships to be memorized identical for direct preparation, formal self-activity, and specialization.

Fortunately, as has already been demonstrated, the test of relative worth is identical, whether the relationship in itself involves direct furtherance through specific discipline, or is acquired as a means to indirect furtherance through formal self-activity that is not specific. For each phase of the educational aim, for each form of educational self-activity, for every specialized vocation or branch of knowledge, that particular relationship is most useful which is greatest in its relative many-sidedness of helpful relationships, frequency of useful recurrence, and degree of stimulus to useful sensation or emotion. If exact determination of relative worth of relationships were desirable, it thus becomes theoretically possible. Many-sidedness, recurrence, and degree can be counted and measured.

2. *The Obviously Greater Usefulness of Essential Material and the Abundance of Optional Material of Approximately Equal Usefulness Make an Exact Determination of Relative Worth Unnecessary*

Practically, however, precision is unnecessary. Both from the standpoint of time effective for memorizing, and that of the relatively small number of relationships sufficiently useful to be made definite and permanent, the differences in relative worth between the most useful relationships and the least useful are so great that they are easily distinguished. Between them there is a safe margin of material, useful enough for certain memorizing, if time permits, but which can never be

made permanent through persistent review. In this *optional* content, useful enough to be presented to all, but from which each individual will choose and retain a varying amount in varying relationships, the precise determination of relative worth would involve closer comparisons and finer distinctions. But the very fact that individual variation in retention and apperception is inevitable makes it immaterial as to which are included from among a number of ideas or activities whose relative usefulness is so nearly equal as to make precise evaluation necessary to its calculation. That is, individual variation in apperception will modify optional relationships to such an extent as to practically offset all minor differences in their theoretical usefulness.

3. *It Follows that Courses of Study, While Uniform in Their Essential Relationships, are Identical in the Relative Usefulness of Their Optional Relationships Rather than in the Optional Relationships Themselves*

It follows that the same years or grades in courses of study in different institutions and localities, in branches rich in content, will be identical only in relationships that they exclude altogether, and in those that are definitely and certainly memorized. That is, they will be identical in relationships so useless or harmful that they are omitted altogether, and in those so essential that all individuals must definitely and certainly master them in common, and usually as a specific part of a definite system of similarly essential ideas and activities. With the optional material estimation of comparative worth of relationships will result in uniformity of content and curriculum, but in a uniformity which consists not so much in identity in the details of subject matter as in the type of details and their approximate usefulness.

In science, for example, the same essential principles will be memorized by all individuals and in all localities, but the details which illustrate them will be partly identical and partly variable, according to the smallness or largeness of the number of those approximately equal in their usefulness.

Oxidation should everywhere be illustrated by rust, decay, combustion, and respiration—the few examples most frequently recurring in every-day life,—but rust might in some environments be better illustrated by scaling tinware, in others by tarnished coins or door-plates, and in still others by tools or machinery left out of doors. Given approximately the same degree of emotional interest, the same heroic achievement will be illustrated in Holland, by sea-beggar and burgher, as in America by continental and pioneer, but the stories of Leonidas and of Von Winkelried become universal through the exceptional force of their appeal to an essential feeling. Various courses of study need not contain the same poems or even masterpieces by the same poets, but all must contain a sufficient variety to develop, in so far as possible, in each individual a love of some truly poetical verse. Two equally useful text-books in history could be written for the same group of children which would be different in almost all details, with the exception of the essential relationships, which should be made certain for all.

After all, however, the tendency that results from continual consideration of the relative worth of relationships is toward identity as well as general uniformity. At many points in the course of study, where there is not a variety of material equally many-sided, recurring or emotional, identity of optional material becomes as necessary as identity of essential material itself. In this there is no menace to individuality or to formal self-activity that is not specific.

Individuality will assert itself, and the variety of association demanded by cumulative impression, mere remembrance, and varying apperception will be brought about, without regard to uniformity or lack of uniformity in curricula, if sufficient time is allowed in the school program for the presentation of optional material that is not to be made certain and specific. Of course, a minimum of individuality would be developed in spite of an irrational and unpedagogical effort to have all subject matter definitely and permanently re-

**The application of the test will tend toward identity in courses of study.**

tained. Its development is encouraged, however, together with that of the forms of educational self-activity dependent upon varying relationships, where optional content is given due recognition in the course of study. While the first step toward due recognition is specification and limitation of the essential relationships that are to be definitely and certainly mastered, and, therefore, to a limited extent specification of the optional material with which it is compared, the proper emphasis of optional material is not assured. Teachers who have been striving to bring about such memorizing of the entire content of text-books as will make it possible for all pupils to repeat from 50 to 75 per cent. of any facts that an examiner may happen to select, are likely to look upon limitation of the amount of essential material as an opportunity for more "thorough" work. The time so gained can readily be worse than wasted, if devoted to the even more monotonous repetition and review that is possible with a smaller number of facts. There must be positive provision and requirement of optional material and training in the most effective methods of presenting it. More than this, it must be tested for and recognized in determining promotion. No school or school system is efficient which cannot stand the test which determines what each pupil individually knows as the result of varying apperception, as well as what he retains and applies of the definite and specific relationships exacted in common of all. On the one hand, he must be asked to give back the precise thing which he has been taught; on the other, he must be given opportunity to tell whatever the thing taught calls to mind.

**Necessity for the training of teachers to emphasize individual apperception in all tests.**

#### 4. *The Certain Memorizing of Essential Relationships a Necessary Condition to the Mastery of Optional Material*

Not that there is no connection between varying apperception and specific discipline. The more one definitely and certainly retains, the more one has to remember by and think with. The "stupid" boy, who may be only a poor

memorizer, will be given a better chance from the standpoint of imagination itself, if the relationships which are most many-sided in their usefulness, are drilled upon until he cannot help getting them. Perhaps time lost in impressing his "dulness" may be compensated for in the comparative readiness with which he will retain what has once been memorized. Such a pupil often succeeds in some phase of life outside, as he ought to have succeeded in preparation for every phase through the school, either because the repetition of certain factors essential to individual efficiency is remorselessly persistent, or because, finally, conscious of his need of others, he perseveres until they become a part of him. Or one may be a ready memorizer, but still lack varying apperception, and, therefore, general discipline, because he either memorizes things that are not many-sided, or, not having been made conscious of their many-sidedness through the varying perception of optional material in school, remains unconscious of it throughout his lifeless and monotonous existence. On the other hand, the careless, the lazy, and even the brilliant pupil may be ready in memorizing and weak in retentiveness. He may remember the useful thing for a time, and temporarily apperceive it in its multiple relationships, but fail to retain it in the specific form in which it is most many-sided, or to make the relationships habitual in which it is most useful. For every type of pupil, whether from the standpoint of ensuring their initial memorizing or permanent retention, or from that of predetermining what is most likely to be retained through association with them, essential relationships must be persistently called to mind in and through the school. R. H. Quick, while himself largely

**The most essential relationships must be made certain in school.**

responsible for popularizing the ideals of the "new education," and, believing that "unless interest is aroused, the mind—of the young at least—does not and cannot work," insisted just as emphatically that "the only way of really getting boys to know things properly is to go over and over again the same ground in class."

5. *Ignorance of Essential Relationships Too Severe a Penalty for Carelessness or Incompetence*

There is a feeling on the part of many teachers that moral discipline demands that the incompetent or the careless boy should pay the penalty for his failure by being retained in lower classes or grades. Indeed, in some schools conduct is reckoned as determining promotion, and pupils actually able to do advanced work are held back as a punishment for idleness or misdemeanor. In others, teachers who have accepted self-activity as the ideal of the new education, without fully comprehending it or realizing the means essential to its realization, refuse to help children in their work on the ground that self-activity is thereby rendered impossible.

How soon will an adequate professional training convince them that self-activity, whether in the form of morality or in that of independent thought and service, is not an unvarying condition to education, but too often its remotest end, and that school and teacher exist not for the sake of bringing the sinner to repentance, but to compel in all the truth that makes men free.

6. *For the Sake of Both Individual and State Essential Knowledge must be Compelled in School*

A system of public education exists less for the individual than for that of the community and the state. Precisely the same grounds on which every citizen is compelled to give financial support for the school and to ensure the attendance of his children, justifies the teacher in compelling, so far as is pedagogically possible, the training for which the school exists. It is in the memorizing and retention of the relationships essential not only to direct furtherance of the aim, but to all likelihood of usefulness for general knowledge and discipline, that instruction can and must be most exacting. No individual must be assigned an impossible task. Those who need four or five times the average amount of repetition for their initial memor-

izing must be distinguished from those who may need four or five times the normal amount of review in order to retain what may have been readily mastered. But more certainly than each future citizen knows his alphabet and multiplication table, must he memorize and retain the few specific relationships which are most highly useful, both in themselves, as directly furthering general preparation for life and specialization, and as a means to every useful phase of formal self-activity.

The amount of such subject matter limits itself. As but little material in unvarying relationships can be effectively memorized and reviewed each day, it will consist in the elementary grades mainly of facts and activities made certain in the specific relationships that are directly useful to the majority of pupils in the greatest number of other relationships and occurrences in every-day life. Some of them will be academic; some reorganized from the standpoint of various phases of the aim. All, if made certain through right method, will be disciplinary. They thus furnish the concentration necessary to specific discipline not through specialization in formal subjects, but through selection from all.

*7. Specialization Varying with Individuals Should Parallel Direct Preparation in General and be Paralleled by It, but Certain Memorizing of Its Essential Material Must at No Point in the Course of Study Interfere with that of the Common Content Essential to All*

Supplementing this essential or directly and certainly useful material is a far greater number of relationships, relatively but little less useful, which cannot be certainly memorized by all in common, but which should be made as many-sided and interesting as possible, connected with life as much as possible, and especially connected with the essential material. It should be presented to all pupils, and all pupils should be required to add from it to their common content, but they should not be

Subjective  
specializa-  
tion in the  
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material.



expected to retain the same parts of it or an equal amount of it. *Subjective* specialization will have its freest range in the elementary grades, through the individual mastery of this optional material, in varying detail and quantity, as determined by varying interests and varying native retentiveness. It does not follow, however, that subjective specialization may not even here take on the more definite form of academic or even professional specialization. On the contrary, the highest efficiency cannot be reached, if a strong native tendency that fits one for an exceptionally successful study of some specific subject is not afforded opportunity for the highest useful development. The concession already made to music or the fine arts must also be made to the pure mathematics or practical mechanics.

The initial limit to *vocational* specialization is found in economic conditions, not merely in the sense of necessity for wage earning, but in the extent to which many-sidedness will so increase efficiency as to justify the postponement and, hence, the shortening of the period of actual service. The postponement of manual occupation, even for the sake of an almost purely academic high school course of study, has been justified by the investigations of the Massachusetts Industrial Commission, of which Professor Hanus of Harvard was the head. The bearing of economic conditions upon the question of a four-year college course, in preparation for medicine and other professions, is at least partially dependent upon whether or not the four-year college course is to omit from its aim the "half-truth of service."

In the high school and other secondary schools direct preparation for life in general must continue, if for no other reason than the fact that it covers the period of adolescence which, as Dr. Chancellor has pointed out, is, on account of its potentialities for good or evil, the most effective time for compulsory school attendance. Since the economic limit to professional specialization varies with individuals, the course

**Specializa-  
tion must  
vary with  
individuals.**

for this period of life will in some schools include directly vocational subjects; in others, subjects that are preparatory to vocational or academic specialization. In fact, in high school and college *academic* specialization solely reduces itself either to subjective specialization or to vocational specialization that itself should be subjective. That is, students should specialize either in that for which they are best fitted by natural ability, or for which they have acquired interest both with and without vocational intent.

Any type of specialization can result in the concentration and repetition necessary to specific discipline. Whether it does or does not, in any case depends upon the efficiency of pedagogic method. Now, it is clear that subjective tendencies which condition adaptation to individuality are most certain to reveal themselves when the individual has been brought in contact in a many-sided way with all possible branches of knowledge and phases of activity. It follows that, even from the standpoint of specialization, many-sidedness must parallel specialization until specialization is complete. That is, while specialization may begin in the elementary school, it must, for its own sake, be paralleled through high school and college by an independent and possibly unrelated many-sidedness which may determine vocation—perhaps along lines quite different from those in which the earlier subjective specialization was begun.

Specialization then, as already pointed out, whether directly for the sake of vocation, or as a condition to discipline, should vary with individuals. For the champions of formal discipline to ensure concentration through insisting that all candidates for admission to college should specialize in two or three common required subjects, would result in the continued exclusion of many not adapted by natural capacity to the work required, and in a lessening of the efficiency of all who could have specialized in other subjects to greater advantage.

After the economic limit which compels vocational specialization has been reached, it must become increasingly dominant in the educational content, but only as an increasingly important phase of direct preparation for life in all its phases. It must not exclude direct preparation for right living, good health, social and civic service, and the proper employment of leisure. Here, however, the problem of relative time and subject matter is not so simply solved as in the elementary school. Here, as there, the amount of time which can be effectively devoted to memorizing and review limits the number of specific and definite relationships which can be certainly fixed, and so leaves free range for individual selection from the optional material presented in many-sided relationship to them. But the specialized material is itself partly dependent upon definiteness and certainty of relationship and the study of branches as wholes. Hence, either the material essential to general phases of direct preparation must have been so thoroughly mastered in the lower grades that only enough time need be devoted to it to ensure its amplification and review, or the professional course must be unduly prolonged. For the trained specialist, as well as for the masses, direct preparation for life must be mainly brought about in the elementary school. But for all economically able to continue their education beyond it, a broader and more certain direct preparation must be ensured through high school, college, and even the most advanced types of vocational school. The point is never reached in education where an occasional lecture on the ethics of a profession or talk on personal purity, public hygiene, or good citizenship can take the place of systematic, cumulative, and persistent training. In this extra-vocational material must also be included the common culture necessary to democracy, both from the standpoint of service and of leisure. But it cannot be a content isolated from the every-day life of which vocation itself is a part. It must be twofold, on the one hand embracing cultural

**In the higher grades specialization must not exclude review of essentials in general.**

material which includes or is associated with the definite and certain relationships necessary to morals, health, social service, good citizenship, and industry in general, and on the other that which includes or is associated with the material essential to proficiency in the vocation itself. To assume that a many-sided content, otherwise cultural, is rendered illiberal through specific and definite association with every-day life, even in the sense of wage earning, is a blunder, pagan, aristocratic, and in itself illiberal.

Direct preparation for life, specialization, culture, and discipline do not differ so much in the details which ensure many-sidedness through optional material, as in the fixed relationships or habits which each brings to bear upon these common details and through which they are reorganized and made useful. That is, they differ in the relationships that are to be thoroughly memorized and permanently retained. Direct and general preparation for life, including the æsthetic training essential to culture, brings to bear relationships definitely and certainly useful to morals and religion, health, industrial efficiency, citizenship, social service, or individual and social leisure. These relationships are quite distinct from, though often inclusive of, those peculiar to the various academic branches. Vocational specialization equally direct brings to bear definite relationships peculiar to it, but includes all relationships which in a general way prepare for industrial efficiency, together with academic relationships and branches in part or as wholes.

Indirect preparation brings to bear, through academic specialization and general culture, specific relationships which have been made at least temporarily certain through instruction, and through individuality relationships which have been made permanent through incidental but cumulative experience.

If not directly related to what continually recurs in life,

**Direct preparation, specialization, culture, and general discipline have a common optional content.**

purely academic or "liberal" habits, whether due to academic specialization or developed as a part of general culture, soon cease to be habits. Losing their definiteness and certainty through lack of repetition, they become partial and variable concepts or impressions, constituting in their sum total "the attitude of mind" which, potentially valuable in itself, is unworthy of President Hadley's identification of it with a liberal "education" as a whole. It is what the traditional college education often is, not what it ought to be. At its worst it may result in aloofness from citizenship and disgust for practical affairs, and at its best, in a social bond between men who have had a common training and experience, and a means to intelligent interest in current academic questions and affairs—virtues that are possessed quite as fully by those whose equally general training has been related to life.

**The relationships essential to vocational and general education partly identical.**

The habits developed through academic specialization and culture must remain definite and specific if specialization is to develop and culture to grow. While in part distinct from those which directly prepare for life, both general and vocational, they should be as fully as possible related to them, not only because through such a relationship to the part of the mental content which both instruction and every-day experience will make most permanent they are themselves given the greatest likelihood of permanence, but because, if they should pass into the stage of mere remembrance or impression, they will, through such initial relationship, still have a great likelihood of usefulness.

Both a partial identity of specific relationships and this necessity for associating specific relationships that are indirectly useful with those that are useful directly greatly simplifies the problem of apportioning between direct preparation for life—general and vocational,—culture, discipline, and academic specialization, the limited time which, through physiological and psychological conditions, can be effectively and healthfully devoted to memorizing and review. The

problem is further simplified by the analysis already made of the conditions necessary to general discipline.

The concentration necessary to specific discipline, then, should be brought about for all individuals through the systematic mastery of the relationships essential to direct preparation for life, and for most individuals also through specialization in the particular subject or subjects which either are peculiarly adapted to their innate or acquired abilities or are essential vocationally. But school life is too short and the time which can be devoted to memorizing and review too brief to require specialization by all pupils, on disciplinary grounds alone.

The limited time effective for memorizing excludes specialization on disciplinary grounds alone.

a formal subject the disciplinary efficiency of which is largely due to the necessity for memorizing and retaining its entire subject matter. Still less should it be required when its specific relationships are not connected with life in general and, therefore, certain to be soon forgotten by all but the specialist. Still less should it be required in view of the great variation in the native retentiveness of students, which condemns a large portion of them to choose between failure in such a subject, overwork, or inability to memorize what is specifically essential in other studies. Still less should it be required for college entrance, when after being temporarily mastered in a preparatory school course, it is reviewed for entrance purposes in the spring and then so completely forgotten in the fall as to awaken the distrust of college instructors in the efficiency of preparatory school training. Concentration, for the sake of discipline on a subject such as this, not only means the readily apparent disproportion of time in hours per week, terms per year and years in course, but a much greater and far more serious disproportion in the demand upon the precious time available for memory work.

## CHAPTER VII

### THE INADEQUACY OF TESTS FOR THE MERE ELIMINATION OF HARMFUL, SPECIALIZED, OR IMPRACTICABLE MATE- RIAL FROM THE COURSE OF STUDY

#### 1. *Dr. McMurry's Test for Elimination Suggestive Rather than Determining*

A STEP which greatly simplifies the determination of the relative usefulness of relationships is the elimination from comparison of a great mass of material that is harmful, specialized, or impracticable. Dr. Frank McMurry's well-known test was suggestive rather than practical.<sup>79</sup> It will continue to have historical value from the fact that it turned the attention of investigators from the relative values of branches as wholes, to that of the constituent details within each branch. It became immediately popular from the situation that confronted the mass of teachers—the introduction of new subject matter into the course of study without any authoritative basis for the elimination of the old. It failed of application because of the vagueness or lack of definiteness of principles whose truth was self-apparent. No modern educational thinker is likely to deny that all details of subject matter should be excluded that are not useful in the broad sense, that are not capable of being related to other details, that are not within the comprehension of pupils and that are not interesting—unless lack of interest is balanced by obvious usefulness and readiness of comprehension and relationship. But even in the sense of direct usefulness, in which Professor McMurry and Dr. Rice use the term, it is unsafe both in being too inclusive and too exclusive. Relationships essential to the indirect furtherance of

the aim through general discipline must not be omitted, while all relationships directly useful to the race cannot be included. All ideas are capable of being related to other ideas. The whole problem of selection or rejection turns upon the relative usefulness of relationships. If Dr. McMurry had in mind exclusion of details that are not capable of being related to ideas in the minds of a particular class of learners, capability of relationship coincides with comprehension. But the possibility of comprehension at each stage of advancement itself depends upon whether completeness of comprehension is exacted or whether a partial concept may be taught. The fact that the most useful of ideas and activities are often the most complex through the very many-sidedness of relationship that makes them useful, and, therefore, beyond the complete comprehension of particular classes of learners, is no reason why they should be excluded. On the contrary, as already pointed out in the discussion of formal self-activity, any idea highly useful to the mass of individuals can and should be taught in some partial relationship in even the lowest school grades as a means to both mere remembrance and varying apperception. Finally, interest in the broad Herbartian sense in which Dr. McMurry uses the term, is possible wherever there is comprehension, and is dependent upon organization of material and method of instruction, rather than on something inherent in the thing taught. While interest, inherent because dependent on sensation, measures degree of usefulness, its absence fails to afford safe ground for exclusion.

The problem of elimination and selection is greatly simplified, if sharp distinction is drawn between the determination of the single relationships whose sum total is to constitute the *content* of general education or of a particular phase of specialization, and that of the relative usefulness of the factors involved in *organization* and *method*. With this distinction held in mind, both the "comprehension" and "interest" of Dr. McMurry's test are probably reducible to immediacy of many-sidedness, recurrence, and emotional appeal.



2. *A More Adequate Test for Total Rejection or Exclusion of Particular Relationships from Both Optional and Essential Content*

Limited to content, as distinct from organization and method, elimination, in the sense of the total rejection or exclusion of particular relationships from optional as well as from essential material, is governed by the following principles: Reject from the general course of study all relationships (1) which are antagonistic to any phase of the educational aim; (2) which are not useful to the majority of individuals who are not specialists, or in a specialized phase of education, to the majority of those who are; (3) which are either being effectively taught outside the institution for which the course is intended, or which cannot be effectively taught within it. These principles are definite enough to be readily applied by the mass of teachers, as well as by the experts responsible for text-books and for courses of study, and they have been in the minds of those who have been responsible for the elimination that in a few at least of the familiar branches already has been brought about. Witness expurgated editions of the ancient classics and selected masterpieces from too realistic modern writers, the omission from arithmetical practice work of operations and terminology peculiar to highly specialized occupations, of detailed campaigning from history, and of anatomical and physiological technique from hygiene. But a more thorough application of the test by experts and committees of experts will serve to check the enthusiasm of the specialist, and regulate a selection that is still often too inclusive.

Principles  
of elimina-  
tion.

3. *Necessity for the Further Exclusion of Material Hostile to the Educational Aim*

From the standpoint of culture, the exclusion of the immoral, the unhealthy, the undemocratic, has already

been discussed. The more artistic or realistic the thing that is sensual or foul, especially if it is some general idea that may become an habitual feeling or attitude of mind, the general stimulus to many-sided thought and action, the greater its menace to useful development and right living.

Even the vivid descriptions of the immoral intended, like those of Tolstoi, to show the inexorable punishment of social evil, together with current effort to teach personal purity through a biological treatment of sex-hygiene, are far more likely to re-enforce the ever-present temptations of sense, than to impress the mind with consequences that are impersonal and remote. In any event, there is no room in a college course in literature for certain phases of Walt Whitman's materialism or the contagious spirit of a drinking song. It is not necessary, however, to carry elimination or expurgation to such a length as the total abstaining lover of Scott, who made Lochinvar, at least at one point, a safer model for youth by substituting for the lines, "With this lost love of mine to dance but one measure, drink one cup of wine," the less alluring couplet, "With this lost Scottish maid to dance but one measure, drink one lemonade."

Benjamin Rush pointed out the danger to democracy in turning Dolly Madisons into Janice Merediths through the reading of romances that idealize aristocratic society. From this viewpoint may it not be inadvisable to include in American school history graphic descriptions of lordly pomp and royal pageantry, as it would be in that of Russia to sympathetically picture the French Revolution.

In our teaching of patriotism we can never afford to omit the heroic achievements in time of war that have given us our national heroes, but we can safely eliminate all that tends to stimulate to bloody combat and unjust conquest. The story of Hannah Dunstan or of Captain Jack was good for our pioneer ancestors, subject to Indian raid and massacre, but today it merely sows the dragons' teeth in the fertile

**The immoral more harmful if it is in æsthetic form.**

**All that is hostile to good citizenship must be excluded.**

imagination of boyhood. The fact that young children, in the fee-fi-fo-fum stage of human existence, are interested in bloodshed and in mortal conflict is no reason why they should be fed on folklore and myth which strengthen feelings and ideals hostile to modern civilization, but the strongest reason possible for either omitting such material altogether, or, where it takes the form of historic narrative essential to a realization of national or ancestral achievement, for associating it with a cumulative impression of the horror and suffering due to war. Longfellow's description of the exile of the Acadians after the burning of Grand Pré, Mary Wilkins Freeman's sensitive but thrilling picture of the Deerfield massacre in "Patience," "Logan's Lament," extracts from Stephen Crane's "Red Badge of Courage," or Tolstoi's "Stebastapool," Sherman's letter to his wife from his first battlefield, should unite with the unforgettable lesson taught by the artist in "the Conquerors," with their inexorable and remorseless march over the victims of war, to make children realize, as strongly as wholesome imagination permits, that "war is hell."

4. *Necessity for the Further Exclusion and Continual Rejection of All That Is Not Useful to the Majority of Individuals Who Are Not Specialists*

So far as I know, W. H. Payne was the first to point out that Mr. Spencer, in his attempt to determine the relative worth of general branches of human knowledge taken as wholes, has failed to distinguish between what is directly or immediately useful to individuals in general, and what is "mediately" useful to the race through the specialist.<sup>80</sup> Although the distinction is a clear one and is continually responsible for elimination, courses of study and text-books are so largely the work of individual specialists that personal interest and enthusiasm serve to check its operation on the side of exclusion. Details are continually creeping in which ultimately have to be thrown out. In arithmetic, elimination from that point of view is fairly complete. Its operations

and applications stand out so prominently that the first flush of criticism revealed those useful only to the few. But in the richer subject matter of science and history, where painstaking analysis is necessary to bring out specific relationships, elimination has been slower; while failure to safeguard the text-book through exclusion has meant the persistent influx of material which is judged available by the specialist, because it is new to the science or has not yet been used in elementary education, but which the test of direct usefulness to the majority must eventually reject.

From the standpoint of the course of study in American high schools, an added evil has been the temptation of the college or university graduate to utilize the specialized knowledge with which he is most familiar, in the absence of the safeguards that can come only with adequate pedagogical training, and close and efficient supervision by experts familiar with the educational problem and the local school system as wholes. Quite distinct from the so-called dominance of the high school by the college through uniform entrance requirements, though involved in it, is this indirect influence of the individual specialist who trains secondary school teachers in his specialty and writes text-books for secondary schools, from the viewpoint of the specialty alone. As Professor Hanus heard a well-known teacher express it, "An aim? I have no aim in teaching!"<sup>81</sup>

While elementary text-books in high school and college are possibly the worst offenders, the common school subjects are not yet fully purged. An analytic examination of any one text in physiology shows that the influx of useful hygienic material has been remarkable, but when the sum total of the newer texts and courses of study are considered, with rare exceptions it is seen that in any one the presence of anatomical and physiological technique, mainly useful through the skilled physician or surgeon, still excludes all but a fraction of the directly useful material which books

**Influence  
of the  
specialist  
upon the  
high school  
course.**

**Physiology  
still in-  
cludes de-  
tails useful  
only to  
specialists.**

and courses collectively present. If minute anatomy, the detailed description of circulation, specific organic juices, O. Henry's remembrance of the shin bone as the largest bone in the human body, with happily vague recollections of glaring manikins and dissected ox eyes are not rejected on the ground that their usefulness is almost solely through the specialist, the application of the further test of useful many-sidedness and frequency of useful recurrence will cast them into outer darkness.

The physiographical geography, which represents the swing of the pendulum from the equal extremes reached by the old geography of location, is also ripe for the pruning knife. It is important to the specialist to precisely define headland or cape, to determine whether Australia is continent or island, to glibly refer to terminal moraine, intermittent spring and world ridge, take daily observations on the weather, and inquire into the local conditions modifying climate in Africa or South America, but with children and the adult who is not a specialist who by some chance continues to remember such a content, it interprets no ordinary experience and starts no associations thronging. It is not something to remember by and to think with.

**Geography too inclusive of physiological details.**

In history, the period is passed in which people might reasonably be expected to respond to the old sea captain's question in Doyle's "Rodney Stone," "How many ships of the line at the battle of Camperdown?" but it still has in many texts too military a caste. It is the cadets at Annapolis and West Point, not the ordinary schoolboy, who should show familiarity with such details of military campaigns as most pupils of twenty years ago have by this time forgotten.

**History still too military.**

While, on the whole, elimination of specialized material forced upon one generation is likely to give way before the resentful common sense of the same generation grown old, the readiness with which it can be detected should prevent its further admission into the common school course.

In the college the situation affords little help, so long as its component courses are so largely left in their details to the mercy of individual specialists. No absolutism is greater than that exercised concerning his specialty by the occupant of an academic chair. When the details of subject matter are not determined by the formal nature of the specialty itself, he can follow his own judgments and interests both in what he offers and in what he exacts, whether from the standpoint of advanced standing or as a condition to further advancement. The natural tendency is, therefore, to specialization within the specialty, often as hostile to its general mastery as to direct preparation for life. Here the only remedy is so authoritative a determination of the relative worth of specific relationships or types of relationships composing the specialty, both from the standpoint of direct preparation and of specialization, that the individual specialist is compelled to discriminate between the relatively less useful and those of greater worth. What is hardest for him to comprehend is that the usefulness of details varies with the knowledge and experience of the learner, in proportion to the extent to which many-sidedness of relationship and frequency of recurrence is possible. Material that is of the greatest possible use to him in some phase of his work to which it is related in a hundred ways and in which it is continually recurring, may be, through the absence of such many-sidedness and recurrence, of little or no use in the specialty as a whole and of practically none whatever outside of it.

In the last analysis, elimination, on the ground of only indirect or mediate usefulness, reduces itself to the rejection of relationships so low in relative many-sidedness and recurrence that their relative uselessness can be readily detected without exact comparison.

5. *All Material Must Be Rejected Which is Being Effectively Taught Outside the School, or Which Cannot Be Effectively Taught in the School*

The rejection of material on the ground that it is being effectively taught outside the school or institution concerned, or that it cannot be effectively taught within the school, has been more frequently used to exclude relationships that the school ought to teach than those that it cannot.

In general, it is safe to assert that since education is a continuing process and development continually going on, every institution which *can* exercise an educational function in the direction of any phase of the educational aim should exercise it. That is, regardless of the shifting responsibility that changing industrial, social, and political conditions have imposed throughout the history of civilization and will continue to impose, upon family, community, church, social classes, state or organized industry and philanthropy, each institution having the educational function must, in the way for which it is best fitted, concern itself with each phase of the educational aim. A particular institution may cease to have any educational function at all, either because it fails to reach individuals during the period of formal instruction, or because they are given over to some other institution that can perform the same service more economically and effectively. But so long as it controls some part of life for those who are to be taught, and can perform in a different way the same service that some other institution may be performing more completely and effectively, it must do its supplementary part. No phase of the educational aim will approach complete realization in the development of the great mass of individuals unless home, church and school co-operate with every other form of educational activity that touches the life of the learner to bring the greatest possible sum total of instruction to bear.

**Each social institution must teach every phase of the educational aim.**

This, however, does not mean that various social institutions responsible for education should teach the same details

or the same relationships. The church, for example, must teach creed, and it is the very argument of continuity that leads the Roman Catholic church to insist upon teaching it in home and school, and various other Christian denominations

to resist the elimination of Christian literature and worship from the public school system. But, whatever be the outcome of the approaching political struggle from the standpoint of creed, whether or not the parochial school system is recognized by the state, and the public school system is secularized or Christianized, religion must be taught in school. The reverence for deity, obedience to divine law, and faith in providence essential to all religions are likely to be beaten down by the force of hostile elements in modern life, if the school, in its teaching of history and literature, fails to utilize the emotional record of deeds and examples that inspire men to worship. The church may exact the bowed head on passing the cathedral door, the bended knee before the image of a saint or imageless chancel rail, and teach the omniscience of God from catechism and psalter. The school can tell of Washington's praying alone in the snowdrifts at Valley Forge, of Lincoln's faith in divine providence throughout the Civil War, and the devotion of Father Breboeuf, or teach, with the added influence of song, Bryant's "Forest Hymn," Longfellow's "King Robert of Sicily" or "Sir Humphrey Gilbert."

But there is no reason why home, church, and school should teach the same relationships or details. Dr. Hall's

study of "Children's Minds on Entering School" has probably been as often used to justify the reteaching of what children already know as to show the need of the Herbartian discovery and "preparation" of what is already in children's minds to ensure the apperception of what is taught. Dr. John Dewey's analysis of the mental steps in-

But each should not teach the same details.

The school has no time to teach details well taught elsewhere.



volved in forming the number concept<sup>82</sup> has undoubtedly, here and there, led to laborious instruction intended to develop arithmetical generalizations made long before outside the school. Local geography of a sort that every book agent, owner of a motor car, or shipping clerk can and will get for himself, wastes time in the same way; drill in the use of city directories and telephone books comes in the same category. There is too much that the school must do, if it is not to remain undone, to include what is well attended to outside—practical though such instruction may appear. It is from this point of view that Dr. Harris' old argument for the three R's is continually reaffirmed by citizens who look upon every new undertaking of the school as superfluity or "fad." It is time for them to realize that, owing to the lessened educational function of other institutions, the fact that, legally at least, it reaches every individual, and the increasing efficiency of its teaching force, the school must increasingly concern itself with the direct furtherance of vital ends to which the three R's themselves are but highly useful means and with which they must not conflict.

This does not mean that the school must include in its course of instruction details of morality, citizenship, or what not which it cannot effectively teach, or that the home and other institutions should carry on a lessened task where they can substitute a different one. Courses in courtship, absurd as too imaginative conceptions of their possible content may be, have greater likelihood of efficiency with young women in the secondary school than the training in the care and nurture of children urged by Mr. Spencer, which should either be given by agencies outside the school to those who are normally interested as wives or mothers, or confined in the school to the "little mothers" of nine or ten, who naturally graduate from doll nursing to the care of younger brothers and sisters. On the other hand, the mere fact that, owing to changing economic and social conditions, the home outside the farm can no longer give the boy the rigid training to

**The school must not assume work which it cannot effectively give.**

industrial routine which formerly resulted from chopping kindling, pumping water, running errands, and going for the mail, is no reason why there cannot be substituted the more varied tasks, along the line of manipulation and repair which would be made possible by an adequate course in domestic science or training which a later chapter suggests for the school.

## CHAPTER VIII

### APPLICATION OF THE TEST OF RELATIVE WORTH FROM THE STANDPOINT OF ALL FORMAL SELF-ACTIVITY WHICH IS INDIRECTLY USEFUL

AFTER all, as is made clear enough at the start, principles of elimination can only reject the most obviously useless or harmful material. Elimination, as well as selection, must, for the most part, result from the determination of the relative worth of specific relationships. The three principles involved must be successively applied from the standpoint of the five phases of formal self-activity, direct furtherance, and specialization.

#### 1. *Application of the Test to Relationships Intended to Further Cumulative Impression*

The material most useful, from the standpoint of cumulative impression, is chiefly measured through the degree of resulting sensation or emotion. It is not it, but the relationship to which it is intended to give emotional force, whose usefulness depends upon many-sidedness and frequency of recurrence. Yet where the emotional material itself is also many-sided or frequently recurring, as in the case of a poem which illustrates many essential truths, or a painting which is constantly alluded to or reproduced, its own value is increased.

Degree of  
sensation or  
emotion  
the chief  
measure of  
cumulative  
impression.

It is from the standpoint of cumulative impression and mere remembrance alone that comparative worth does not ignore the greater readiness with which resulting sensation

or emotion causes a relationship to be memorized or retained. The test for the inclusion of material in the *essential* content is relative usefulness, not relative ease of mastery. If relationships are useful enough to result in specific discipline, it will be assured through effective method. It does not matter how readily acquired and persistent impressibility may make them, if it does not increase their usefulness. On the other hand, *optional* content, wholly dependent for initial retention on the mere remembrance to which it is a means, is more useful, if interest and impressiveness tend to hold it in mind. Of course, the mere readiness of mastery, which works against interest and impressiveness, is useless even to mere remembrance.

Only impression and remembrance furthered by impressibility and readiness of mastery.

The form of sensational or emotional appeal which counts the most varies with the relationship that is to be made impressive and must be adapted to it. Description of emotional action, literature, eloquence, music, dramatic imitation, allusion, visual representation through picture, model, or sculpture—sometimes one and sometimes the other, but, so far as possible, all must be brought to bear whenever the relationship is important enough for its emotional associations to be made sure. From among the forms that are possible those illustrations and examples must be selected which are not only in themselves emotional, but which are emotional in the highest degree and with the greatest many-sidedness and frequency of recurrence possible to each form, and which carry their sensation or emotion over to the thing to be emotionalized.

Form of emotional appeal must be adapted to the relationship to be made impressive.

Below the upper limit of useful emotion, however, the determining factor is the relative degree of emotional interest thus transferred. The many-sidedness of relationship and frequency of recurrence of General Grant, re-enforcing the degree of feeling aroused through the story of his prompt submission to the game warden, makes it more likely to be re-

called, by American boys at least, and hence more likely to be retained as an active contributor to the wish to be obedient to law, while that of Prince Henry and the Chief Justice will similarly persist in the imagination of one familiar with English history or Shakesperian drama. The emotional appeal being sufficiently high in the two cases in question for them to be unquestionably included from the emotional point of view alone, many-sidedness and recurrence become determining. An illustration less many-sided or recurring, but of equal emotional interest, would not be so useful. But if one incident was of much greater emotional interest than the other, its emotional appeal would be determining, since in order to utilize it instruction can make it more permanent than incidental recurrence; where emotion should be high in degree as well as persistent through a cumulative sum total, degree is even still more determining.

The mere concreting of an emotional idea or of a conception in which interest is to be aroused—a sword of Bunker Hill, a silver franc inscribed with the head of Louis the Sixteenth, a fragment of the Colliseum—all serve, in greater or lesser degree, like the button from a uniform or a lock of hair, to increase an emotion that already exists, even though an object or a fragment which, in the absence of association, is of little use or no interest.

On the other hand, a humorous or pathetic story or an attractive object may in itself possess an interest or result in an emotion which actually distracts attention from the thing illustrated or exemplified. This is, of course, always true when the added interest is wholly in the illustration, as when children count some new and attractive objects without motive for interest in their number. It is, after all, the method of instruction and not merely the application of the test of emotional worth that ultimately determines whether the music of the minuet will make one think of dances quite outside of histories and schools, or call to mind the fragrance of bayberry candles, the rustle of colonial poplins, the gleam of India brocades and powdered queues.

Where cumulative impression has for its aim æsthetic judgment and appreciation, the enjoyment of the emotional material is an end in itself, though, as Master- has been already urged, the masterpiece of pieces of art literature or of art is the more useful when it most useful which fur- also serves to strengthen an ideal or to give ther all added interest to what directly furthers not phases of right living. culture alone, but industry, morality, or patriotism as well.

While self-expression in the sense of skill, whether æsthetic or narrowly utilitarian, belongs to direct furtherance and specialization, the pleasure or self-satisfaction which accompanies individual right activity not yet become habitual, or purposeful imitation of what is being made ideal, should be utilized as an important factor in cumulative impression. On propitious occasions it should be stimulated through congratulation and applause to the emotional pitch of happiness in what has given pleasure to others and of wholesome pride in self-achievement.

Finally, impression is re-enforced by the milder interest which arises from the ease of accomplishment that comes with right habit, and the similar feeling due to physiological readiness in apperception itself. On this side, interest is dependent upon recurring experience or method of instruction.

But while interest can be thus developed by method in any relationship that is useful, and no relationship that is useless or harmful can be made useful through interest, it is none the less true that until cumulative impression is strong enough to make a useful idea sufficiently dominant to serve as the motive force for general discipline, the relative usefulness of material which re-enforces it is largely determined by its relative degree of interest, feeling, or emotion. In ensuring cumulative impression it is the most emotional examples and illustrations that should be made certain through specific discipline, regardless of their many-sidedness or recurrence, except where they are approximately equal in their emotional appeal.

## 2. *Relative Worth from the Standpoint of Mere Remembrance*

Three distinctions are prerequisite to the application of the test for relative worth from the standpoint of mere remembrance—the distinction between optional and essential relationships, between ultimate and immediate usefulness, and between directly or specifically useful and generally or variably useful material. Since an essential relationship is ultimately to be made certain through specific discipline, it belongs to mere remembrance as well only during the period in which it is held in mind as a partial concept through a relationship which for the time being does not perform the further function of apperception. Until the name California begins to be cumulatively apperceived, it remains in the stage of mere remembrance, even though it is definitely held in mind by a whole primary school class through a common and specific association with orange-growing, in place of or in addition to incidental or optional associations varying with the individual pupil.

Whether optional or essential, the usefulness of a relationship is *immediate*, if it is likely to recur occasionally or to become a center for new associations before it is forgotten. In the case of the *optional* relationship not made certain through the formal repetitions of instruction, immediacy of *interest* being necessary to attention and retention, conditions immediacy of usefulness. Its interest, however, may spring from its many-sidedness rather than from inherent sensational or emotional appeal. In the case of the *essential* relationships, retained as partial concepts through repetition and review, immediacy of usefulness through many-sidedness and recurrence can be ignored only if so few essential relationships are immediately useful as to make the task of future memorizing too great through failure to utilize not only the time available for memorizing and review in the earlier stages of development, but the greater interest that children possess in mechanical memorizing, re-

To serve  
mere re-  
membrance  
optional  
material  
must be im-  
mediately  
useful.

collection, and remembrance before their interests are determined by a continually broadening mental content. For the purposes of mere remembrance, then, *optional* material must be immediately useful; that is, immediately many-sided or recurring and immediately interesting. But essential material should possess a many-sidedness and recurrence partially immediate, unless the ultimate memorizing of the greatest possible sum total of essential relationships demands the utilization of all time effective for memorizing and review throughout the course, and hence of the immediate interest in memory work peculiar to the early school years. When the test is actually applied, however, an abundance of essential relationships will almost certainly be discovered whose many-sidedness and recurrence are partially immediate and capable of being taught through method that will ensure maximum interest.

Now, it is highly important, both to useful apperception and general discipline, that each highly useful concept, as a whole, should be given the greater permanence and associative re-enforcement that comes with the continuity possible through the early mastery even of the mere word denoting a partial essential concept. If the concept is emotional, cumulative impression gradually comes to give it a dynamic force that is irresistible. Even in the absence of emotional associations, its persistent many-sidedness involves at each recall the general stirring of mental content, which Külpe says results in direct recognition, and which lies at the heart of Herbartian interest. The idea has become a part of life and of character in a sense that is impossible when it is not memorized until it can be fully understood. From the standpoint of mere remembrance it cannot too early begin its function of accumulating and holding in mind otherwise mere fugitive or less usefully related ideas in relationships that directly and permanently further the educational aim.

The function of the word denoting a partial essential con-

**Essential relationships need the cumulative force possible from early mastery.**



cept that is indirectly and generally useful, is to hold ideas in mind in relationships which may not in themselves be directly useful, but which further a complete and variable apperception, and hence the mental interrelationship that assures intercommunication between them and any field of knowledge and experience. From the standpoint of mere remembrance, essential ideas, whether directly or indirectly useful, being themselves certainly retained, use their cumulative many-sidedness, recurrence, and consequent interest as means to remember by. Optional relationships, on the other hand, use their immediate many-sidedness, recurrence, and interest as means to being themselves remembered—if by directly useful ideas, with the result of strengthening the dominance of some central relationship through the centripetal phase of apperception; if by indirectly useful ideas, with the result of more completely interrelating all ideas and so indirectly ensuring through the centrifugal force of apperception, the more general application and dominance of the useful. Hence, the test for the selection of material useful for mere remembrance concerns itself with essential relationships whether directly or indirectly useful, that are to be made certain as the means to the mere memorizing of others, and with optional relationships that are themselves to be remembered. The test for these three classes of ideas is in part identical. In the case of both essential and optional relationships, ultimate many-sidedness, frequency of recurrence, and degree of sensational or emotional effect are determining for selection from the standpoint of the course of study as a whole, but the point in the course of study at which they shall be first memorized is fixed for essential material by the immediacy of merely occasional recurrence and very partial many-sidedness, which certainty of retention will make cumulative; and for optional material by an immediacy of recurrence and interest without which there is little apparent chance of

For them, cumulative associations a means to remember by; for optional relationships, to being remembered.

When partial mastery should begin, fixed by immediacy of usefulness.

retention at all. Every idea presented to the mind, over and above what instruction can ensure, has some chance of being retained, and may constitute a connecting link in some series of associations whose new or exceptional usefulness no test for relative worth can anticipate. It is the task of instruction to make certain the retention of those whose direct or indirect usefulness in high degree can be foreseen, and to make as probable as possible the mere remembrance of those immediately many-sided and recurring enough to be retained, if they are even for but a little time held in mind.

The importance of this initial memorizing or holding in mind is the justification of the usual attempt to get from the learner all that text-book and lecture have presented. That is, in the first recitation upon matter once presented, the teacher is justified in his customary effort to see that his pupils or students are getting it all, if he will discriminate between the ideas which they must permanently retain in specific relationships and those which it will be useful for them to retain in any relationship at all. But each idea chosen from this material not made certain through recurring review, which is to be given the best chance of survival, must be recurring in some relationship or other in the immediate experience of the learners, and its chance of persistence is greatly increased if that relationship is an interesting one or if the material itself is inherently interesting through its sensational or emotional appeal. Many-sidedness is a test of only ultimate usefulness, unless it results in immediate interest or recurrence.

### 3. *Genetic Conditions Determining Only for Optional Material*

It is only from the viewpoint of cumulative impression, mere remembrance and hence varying apperception, and in the determination of the point in the course of study at which optional material shall be introduced, that readiness of mastery or immediacy of interest due to genetic conditions,

“nascent period” or culture epoch, determine selection. Where relationships are not so many-sided, recurring or high in degree of permanently useful feeling or emotion as to be included in the essential content whose retention will be compelled, those which appeal to innate tendencies and inherent interest limited to some stage of development or strongest at such a stage, have the greatest likelihood of mere remembrance. Given approximately equal worth from the standpoint of many-sidedness and recurrence, those relationships should be selected for impressive presentation at each period of advancement which have through interest the best chance of survival. Indeed, relationships relatively less recurring in themselves or through immediate many-sidedness, should be included on the strength of high degree of immediate interest, unless they exclude from effective presentation others whose many-sidedness and recurrence are immediate enough to ensure not only mere remembrance, but cumulative apperception. Of course, the brightly colored, the beautifully formed, the fragrant or what offends through its odor, things pleasant or repugnant to the taste or touch, whatever makes one laugh or weep, angry or ashamed, enjoyable or unpleasant activities, are likely, for a time at least, to be held in mind, but even lengthy and meaningless words which are rhythmical or sonorous—the Constantinoples and Popocatapetls of childish vocabularies—tend to remain in the memory when more many-sided and even frequently recurring ideas, through lack of impressiveness, pass in one ear and out the other. Here remembrance is not left solely to chance. It is either made reasonably probable through the sensational or emotional appeal of the presentation as a whole to some tendency or capacity known to be in the mind, or made more readily possible through a many-sided presentation in the hope of increasing the chance of association with a mental content that is either variable or unknown.

#### 4. *Words the Most Useful Material from the Standpoint of Mere Remembrance*

The material chiefly useful from the standpoint of mere remembrance is words. They are the symbols or counters by which otherwise fugitive experiences are individually held in memory, called to mind, and apperceived. Each word that is retained becomes a center for the retention of the idea or group of ideas for which it stands, for the words that express them, and for other words and ideas. Growth of vocabulary, therefore, no matter how partial the concept retained, is an index not only of mere remembrance, but of readiness of varying apperception, and hence of the possible range of general discipline. The ability to write words greatly increases the possibility though not the certainty of both mere remembrance and specific discipline. The habit of quickly jotting down expressions or ideas that otherwise stand little likelihood of being recalled, merely gives further opportunity for getting them in mind. When note-taking is regarded as an end in itself, especially the taking of lecture notes, it actually interferes with retention, whether partial or exact, by distracting attention from ideas and breaking in on the continuity of discourse. Where the lecturer puts essential propositions into a syllabus that can be memorized, and note-taking concerns itself with otherwise evanescent ideas that will later become the objects of thought and reflection, the purpose of mere remembrance is better served.

Of course, ability to write involves ability to spell, and has its usefulness conditioned by ability to read what is written. Furthermore, reading is in itself the most important means to multiplication of vocabulary and hence to mere remembrance, as well as to varying apperception and general discipline. Travel, conversation with well-educated or broadly experienced people, attendance upon public lectures, all serve the same end.

Ability to read and to write are general in their usefulness,

and must ultimately be acquired without regard to the relative value of individual words. For them the relative many-sidedness and recurrence of words are determining only in the earlier stages of instruction where but a limited number of particular words can be formed or recognized. In the end, it is phonograms that must be sounded out and blended and sequences of letters that must be as frequently recurring and many-sided as thought itself. Spelling, too, must finally involve the ability to perceive and to write any word phonetically and the habit of observing phonetic exceptions in all new words that are remembered. In so far as the spelling work of the school aims to ensure the correct writing of specific lists of words and to make necessary the selection of particular words to be drilled upon, spelling belongs to the essential rather than the optional content of mere remembrance. But, both in specific spelling and where particular words in word-study and discussion are to be presented to the learner in the hope of mere remembrance through some incidental and individual relationship, the principles of selection hold. It is here that the multiplicity of words connected with regular school work and supplementary reading can be drawn upon, not for spelling drill and review reserved for those most essential, but to be held in memory as wholes until they come under the operation of the habits necessary to the spelling of words not drilled upon in school. The words, whether to be memorized as wholes or both memorized and spelled, must be more or less many-sided and occasionally recurring, but as distinct from those whose mere remembrance in some partial relationship is *essential* to direct preparation, need not be certainly useful. Where they are equally many-sided or recurring, the degree of immediate feeling or emotion inherent in them or due to a relationship with other ideas, which is made conspicuous in presentation, is determining. Foreign products in geography that can be related to some familiar use to which they are put, words in a foreign vocabulary that are in themselves

The test for relative worth applies to the selection of both essential and optional spelling words.

beautiful or occur in the titles of familiar masterpieces of music, literature or art, should be selected in preference to those equally many-sided and recurring, but not equally likely to be retained through feeling. The manysidedness may be more or less remote, and make possible the gradual broadening of concepts as the years go by. Recurrence, too, need not be immediate in determining the selection of words that are to form a part of content in general without regard to the stage of development at which they are introduced, but in determining their place in the course of study, recurrence must be immediate or mere remembrance cannot be depended upon to continue to hold them in mind.

It is especially useful, for example, to utilize the interest which a boy has in things warlike, to present to him through reading and story such military terms as will be used in his history before the end of the term or the school year.

While words and ideas so high in their relative usefulness that they should be certainly remembered as early as possible though in a partial relationship, are, through the definiteness of that relationship, a phase of specific discipline, they are none the less a means to mere remembrance. From this point of view, their ultimate many-sidedness or recurrence must, of course, be of the highest and partially immediate, whether direct or indirect in its usefulness.

On the side of both direct and indirect usefulness, invaluable assistance is given to mere remembrance, and hence

**General  
ideas and  
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as memory-  
centers.**

to varying apperception and general discipline, by definitely fixing ideas in classes through general similarity in use or meaning, and general association in historic periods and geographical locality.

The same function is served in part by artificial mnemonic systems, but without the invaluable furtherance of varying apperception and general discipline which will be fully illustrated in discussing the application of the test for selection to the former. What is certainly held in mind is not only for the sake of having something to remember by, but to think with.

From this standpoint of apperception, association with the general idea or logical group is direct, and, while ensuring rational recall, does not necessarily tend to more many-sided reassociation and apperception. The place of the new idea is fixed and further attention may not be directed to it. Association in general geographical or historical location, however, leaves the idea in close mental juxtaposition with a great variety of others, with any one of which it may have something in common.

From the standpoint of remembrance, the advantage lies with the general idea or logical group. Where a name as a memory center makes similarity or partial identity conspicuous, the cause of its efficiency for mere remembrance is apparent. Every idea in the group to which it applies being partly identical with every other, the memorizing of any one means the partial memorizing of all; if the learner is conscious of the similarity, classification or association with the memory center must result from such consciousness. The new word has as part of its form or meaning something that is already known which puts it into association by similarity not only with the general term, but with every other subordinate word in a well-remembered group. It also possesses as an added means to remembrance the association through contiguity in the mind, and perhaps objectively in time and space, upon which words not associated with general ideas are solely dependent for remembrance and recall.

At first thought it seems likely that the words and relationships most useful in this general way are taught through daily experience; that they are known to all just because they *are* many-sided, recurring, and more or less interesting. But sharp distinction must be made between words that continually recur because experience compels them, and ideas that would continually recur in experience if they were once associated with the words by which they

**The general idea tends to aid mere remembrance alone.**

**The general words most useful as memory centers may fail to be taught by incidental experience.**

could be identified and recalled. This distinction is readily apparent in the case of directly useful ideas. Here instruction, constantly supplementing experience, adds such general terms as prophylactic treatment, germs and germicide, food adulteration, and antiseptic to sickness, pain, food, and medicine already in the vocabulary of every-day life, but little more frequently recurring and often enough less useful than the terms which instruction makes equally sure. In the case of indirectly useful words, however, instruction has been as incidental as experience itself. Careful determination should be made of the relatively few terms indirectly and generally so useful to all from the standpoint of mere remembrance and varying apperception, that they should be certainly memorized in the most useful relationship which will hold them fast, but, if necessary, in a relationship which in itself is not useful at all. They will be chosen mainly from among the names of branches of human knowledge, general terms of science, departments of literature, activities of mind or body, etymological roots, geographical localities, and historical periods or epochs.

The memory centers most useful in direct furtherance of the aim, and, therefore, the earliest that should be memorized for its indirect furtherance through remembrance and apperception will be determined by applying the usual principles of selection to the subject matter directly useful to religion, morality, health, general industry, social service, citizenship, and avocation. Similar application must also be made to the subject matter of the academic branches. The application of the test in the determination of the general ideas most useful as memory centers in only indirect furtherance of the aim can be best illustrated at this point. Many of them, of course, become familiar outside the school-room. Man, woman, food, clothing, house, home, work, play, tree, plant, flowers, fruits, animal, bird, fish, insect, stone, book, good, bad, and many other general terms, each of which includes a multitude of partially identical or similar

**The words  
and groups  
indirectly  
most use-  
ful as mem-  
ory centers.**



particulars, furnish the chief means by which we remember new words and ideas. Botany, as the science of plants, zoology of animals, and mineralogy of minerals, as well as history as the story of the past, and geography of the home of man, are immediate in recurrence and many-sidedness to children in the primary school. Biology, as the science of life and growth, psychology of the mind, chemistry of changes that show what things are made of, and physics of all changes that do not, have their immediacy of many-sidedness, recurrence, and interest a little further along in the course of study. Terms gained from anthropology, and philology and from such formal subjects as grammar, algebra, and the higher mathematics, are not useful for remembering words falling within the experience of children; nor do they contribute many memory centers for college graduates. While psychology is not related to experiences of which young children are incidentally conscious, it can as a general term readily be associated with a few frequently recurring experiences such as sensation, feeling, association, apperception and habit, of which they should be made conscious in order that they can more readily further their own development. Other examples of names standing for general ideas highly useful, not only to mere remembrance of names and experiences, but to logical classification, are analysis, oxidation, alternative, alumnus, author, avocation, solution, adulteration, fiction, travel, encyclopedia, agriculture, autobiography, science, anonymous, and exploration. While, as compared with each other, they vary greatly in recurrence, many-sidedness, and interest, and in the immediacy of each, they are readily distinguishable in relative usefulness from the great mass of words from which they are selected.

Of the eight or more thousand words in Webster's unabridged dictionary beginning with "a," only about a hundred not found in the every-day vocabulary of the mass of people appear on superficial examination to contrast sharply with the remainder in relative direct and indirect usefulness. Of these, fifteen or more, such as abasement, abbrevia-

tion, abode, and abridgment, are loosely synonymous with words in the commonest use. Of the remainder, about

**The relatively small number of words useful as memory centers.**

twenty, while frequently recurring, aid but little, through many-sidedness, in remembering other words or ideas. On this ground, the memorizing of such words as abatement, abdomen, abettor, abeyance, abortion, and absconder may be safely left to optional content. Approximately, fifty words from the eight thousand, that cannot safely be left to ordinary experience, stand out more or less prominently as those useful in remembering others. As they are either included in the tests already given, or will be fully represented in those that are to follow, they have been referred to at this point only as a rough indication of their probable proportion when more accurately determined. The association of general terms thus highly useful with the branches of knowledge to which they belong is not only an aid to memory, but the first step in the building up of system. In this manner, solution and analysis can be associated with physics; analysis and oxidation with chemistry; and author, fiction, travel, autobiography, and anonymous with literature. The useful system thus embryotically begun, as it cumulatively results from the application of the test of relative worth, should be the main end of instruction, and with its knowledge and activities fixed in their most useful interrelationships and subordinations, ultimately come to include all that education can bring to bear upon life.

The systematic classification of words, through association, with the parts of speech and consequent organization through grammatical relationships, at first thought better fitted for furthering the memorizing of words than the system peculiar to any other branch, is on investigation found to be valueless. The use and meaning of words determines and suggests their grammatical classifications, rather than grammatical classification the meaning and use of words. Grammatical classification, however, to a limited extent in

**Grammatical classification and number useless for mere remembrance.**

English, and in high degree in an inflected language, determines and hence recalls the form of words. This aids memory in determining the correct form in which words are to be put to use. Furthermore, the resulting grammatical language or correctness of speech is highly useful in direct furtherance of all phases of life, especially the cultural and social. One is little likely to remember a word, however, by the fact that when used as an adverb it ends in "ly," or that it expresses "action, being, or state of being." This is merely a concrete way of saying that a very general term is little likely to suggest an especial particular, unless at a stage of its mastery when but few particulars are known. "Chemistry" may readily suggest the few chemical terms known to children, but "verb" or "noun" applies to almost their whole vocabulary. When the grammatical group is less inclusive, as in the case of pronouns or conjunctions, before the particulars are classified under a common name they are for the most part too familiar to need remembering. Number, also, is too general to aid mere remembrance, except where, in place of applying to varying combinations of units, as three dollars, fifty persons, or a hundred pear trees, it suggests such fixed and definite numerical combinations as triangles, fifty-cent pieces or centuries.

While grammatical classification is negligible as an aid to mere remembrance, except the remembrance of grammatical distinctions themselves, etymological grouping, through its association of identical forms and meanings, is of the highest value. This does not justify the revival of the old time etymology of the grammar school with its effort exhaustively to present the English derivatives of Latin or Greek roots, regardless of their relative usefulness, but rather the certain memorizing in each school grade or each stage of development, of the roots whose many-sidedness and recurrence are sufficiently immediate to be useful to mere remembrance. Roots which frequently recur in useful

**Etymological grouping of high value for remembrance.**

English words not only serve to recall the words themselves, but their meanings as well.

Distinction must be made between etymological roots, as memory centers for words and as a means to remembering their spelling. The modifications in the form of words, due to the growth of a language, often make etymology a false guide to spelling. The difficulty is easily met so far as the mastery of specific word lists in school is concerned, by including among etymological groups of words to be spelled only those which etymological analogy will aid.

Outside of etymology, which itself suggests meaning, and the general ideas and logical groups with which association

**Names of  
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and histor-  
ical periods  
as memory  
centers.**

not only gives a likelihood of mere remembrance, but of thought and intelligence as well, the most useful memory centers are the names of general geographical localities and historical periods. The extent to which they approach the exact and the particular is determined solely by the extent to which the experience of learners includes details that can be usefully remembered by them. That is, it is determined by the immediate many-sidedness and recurrence of particular exact locations. The child in the first grade, as soon as he begins to learn facts about the past, should at least have given him ancient times as "long, long ago," and the periods of discovery, settlement, the Revolution, and the Civil War, as he begins to have ideas which can be centered about them. A little farther along, the names of the kings and queens of England, from Henry VII down, and of the presidents of the United States will be highly useful. Only the specialist in American history need associate events with particular years or even decades, because, for all who are not specialists, the more general periods are ample to remember by and think with. Only the Egyptologist needs the names of the Egyptian dynasties or the classical specialist of minor Roman emperors. For the ordinary learner, they are names that must themselves be remembered, rather than means to remembering others.

So with the names of towns and cities. Of the twenty given in the dictionary under "a," probably from the fact that frequency of recurrence figured in their inclusion, almost all are needed by the great mass of learners—Africa, Alabama, Alaska, Alexandria, Algiers, Allegheny, Alps, America, Atlantic, Armenia, Arizona, Arkansas, Appalachian, Arabia, Asia, Austria, Australia, and Athens. The remainder, Albany, Atlanta, and Atlas, together with the thousands of other names that the gazeteer or atlas would associate with grand division, country, or state, are not memory centers so highly useful to ordinary learners that they must be very early fixed in mind, but rather to be remembered by association with centers that are. For Europeans, Albany is useful only as a city in America; for Americans, and even for most New Yorkers, as the capital of New York and on the Hudson; outside of its inhabitants and immediate neighbors, a few politicians, business men, or postal clerks, may find its association with a county worth while; for primary school scholars it has little use at all. Atlanta or the Atlas Mountains do not bring into even a cultured mind such a rush of ideas that they must be fixed in memory as centers to remember by. In the first school grade, Africa, America, Alaska, Arabia, Asia, Atlantic, and Australia are all more immediate in their many-sidedness and recurrence than island, volcano, peninsula, and other physiographical concepts, taught because they are simpler, and each one of them can be presented in relationships more immediately interesting. As great memory centers they will surely hold in mind, and be held in mind by gorillas and ivory; the country in which we live, and in which can be located dozens of familiar names of towns, rivers, mountains, and states; miners and reindeer teams; deserts and coffee-berries; Chinese children, chopsticks and little shoes; ships, fish and shells; and Bushmen, sheep, and kangaroos. Why should they be displaced for the few anemic germs of scientific truth that can be associated with smoking craters and water-encircled land, even though modeled in sand or identified in rain puddle and lantern slide? It is neither the

world as a whole nor local geographical units which best stand the test, but the parts which, whether large or small, near or remote, serve as memory centers for most ideas and names.

When such general historical periods or geographical locations are associated in their necessary juxtapositions and sequences, the facts remembered by them are not only retained in relationships that are permanent, but useful apperception is assured through the detection of resemblances otherwise unlooked for between them and other ideas thereby brought into mental contiguity with them. In such artificial mnemonic systems as that of Loisetete this furtherance of logical and essential association is lacking. When, however, Hiawatha and Robinson Crusoe are selected by the Herbartians as the basis of association for the entire work of a school term, the natural interests of children are admirably utilized from the standpoint of mere remembrance, but from that of apperception, so far as the story itself is the basis for recall, ideas are placed in relationships that are temporary, incidental, and of small potential usefulness compared with those discoverable by instruction unhampered by the boundaries of a petty isle or the atavistic limitations of a primitive life. Rather, partial concepts of factories and mills, of steamboat lines and railroad systems, of Mediterraneans and Great Britains, than "simpler" and never fully comprehended ideas of goat-skin capes, canoes, and stockades are the germs from which complex modern life and civilization will most surely and rapidly grow. Here is the same alternative that confronts the teacher before children enter the primary school—the usefully prophetic plays of the kindergarten, or the more "natural" plays made interesting through the biological survival of prehistoric hunts and ceremonials.

All words used as memory centers or remembered by them need not be read, spelled, or written. Until words can be readily sounded out, those used in the reading

lesson should, for the most part, be familiar to children and lend themselves to phonetic drill, for phonetic reading removes all limits to the expansion of vocabulary. From the standpoint of both mere remembrance and many-sidedness, much reading is more important than the reading of what develops æsthetic taste. Crude stories that interest children should not be excluded from public and school libraries for lack of literary tone, if, through dealing with various occupations, industries, periods and environments, they tend to broaden juvenile interests and vocabularies. The books that should be inexorably excluded are those which by juvenilizing literature and "simplifying" language in an absurd syllabic sense, prevent the addition of new words to the eager and word-hungry memory with which childhood is blessed. School readers, used in class instruction and for oral reading, however, should not be informational. Aside from the aid given by the æsthetic, and especially the emotional and dramatic content of good literature, to expressive reading, conversation, and eloquent speech, the vocabulary of culture cannot be too early acquired.

**Much reading an aid to remembrance, through vocabulary.**

Apart from a more or less general prejudice against phonetic reading, on the ground that it is antagonistic to correct spelling, the greatest obstacle in the way of rapid vocabulary expansion is insistence upon the spelling and more or less exact definition of every word that happens to be included in a reading lesson. Specific spelling drill, including the repeated writing of particular words, should be limited to those that immediately and more or less frequently recur in the type of writing peculiar to each stage of development. The words whose spelling should be thus made sure are the ordinary verbs, adjectives, adverbs, pronouns, and connectives, but include among nouns, only those that are commonly written by all who write at all. Dr. Chancellor has probably come closest to a correct list by basing his selection upon frequency of recurrence in the daily papers,<sup>83</sup> though

**Specific spelling drill should be limited to words common in ordinary writing.**

many words frequently recur there that ordinary individuals will not have to write. Without regard to the prevention of interference with vocabulary expansion through school reading, if pupils are to leave the elementary grades "good spellers" of the words they will continually have to write in business and social correspondence, the number of words selected for specific drill must be so limited that continual review will be possible. Perhaps experimentation may prove that Cleveland has been too parsimonious, with its two or three new spelling words a day, but the result has been better spellers.<sup>84</sup> Memory centers for words as wholes may be of use, at this point, to spelling as well as to oral vocabulary, through holding words long enough in mind, during the period of initial memorizing of their spelling, for the spelling to be repeated until retained. If the word, as a whole, is forgotten as soon as the lesson is over, the time used for drilling upon its spelling is wasted. This holding of the words themselves in mind is the only justification for grouping words in spellers, as names of flowers, household utensils, and so on. If it is limited to the period of initial memorizing, it need not interfere with the gradual formulation of cumulative lists of words similar only in their spelling. Where, as in the case of etymological grouping, words are similar in meaning as well as in spelling, both initial spelling and its retention are furthered.

The worst type of spelling list, though one of the most popular, on the plea of adaptation to local and immediate needs, includes the words most often misspelled from the readers and other text-books in local use, without regard to the frequency with which they will be ordinarily used outside of written recitations or examinations. Specific spelling-drill on words brought into a particular school-book through the taste of an individual author or the necessity of a single description or narrative, not only prevents adequate drill on more useful words, but miscellaneous words multiply too rapidly to be persistently reviewed. They should not be repeatedly spelled, but should be incidentally used for developing



the habit of observing the spelling of all new words, through unconsciously sounding them over to one's self and noting phonetic exceptions.

The mastery of a foreign language, duplicating as it does the vocabulary of the vernacular, develops few centers useful to remembrance. A foreign vocabulary is not something to remember by, but something to be remembered. Its value is from the standpoint of varying apperception, specific discipline, and direct usefulness. On the other hand, for most college graduates who are not specialists, as the years go by and specific systems of thought are forgotten, the part of the college course which does not cluster as impression about ideals and principles, has been mainly serviceable through mere remembrance and the individual and varying apperception which it makes possible.

**Mastery of foreign languages affords little aid to remembrance.**

#### 5. *Application of the Test for Selection to Varying Apperception*

If apperception were to be confined to the incidental association and reassociation of ideas common to ordinary experience, the selection of material favorable to mere remembrance would be fully adequate for apperception as well. To fix certainly in mind the most many-sided and frequently recurring ideas, both directly and indirectly useful, and, with the aid of effective method, to bring consistently to bear upon them and the multitude of other memory centers made certain by individual experience, the ideas which have been selected on account of their useful many-sidedness, recurrence, and interest, is to ensure a many-sided and useful apperception, but not the most many-sided and the most useful. If apperception is to be made either directly or indirectly useful in the highest degree, individual memory centers must be certainly associated together in interrelated groups and subdivisions. The individual memory centers may be numerous enough or general enough to reach out after, and for a time retain, any idea presented to the mind, but, if they

**Systems of memory centers necessary to varying apperception.**

are not memorized in groups which the usual test of relative worth has shown to be highly many-sided and recurring, varying apperception will ensure neither the cumulative many-sidedness, which makes the useful idea potent, through general discipline, nor the complete system of mental inter-connection essential to the greatest possible variation, and, therefore, to the most general application.

That is, both the direct and indirect usefulness of varying apperception are dependent upon specific discipline—in the

Only many-  
sided and  
recurring  
groups aid  
varying ap-  
perception.

sense of system, as well as through the certain and definite association of each individual idea. The groupings and the systems directly useful in the highest degree will be determined for each phase of the aim from the standpoint of specific discipline, and will include all academic or formal groups and systems that are directly useful enough to be certainly memorized. But, while all directly useful groups that are useful to varying apperception will be included, from the standpoint of the special phases, all directly useful to the various phases will not necessarily be useful to varying apperception and serve to make varying apperception directly useful. Such a group of ideas, as the association of the name of Lincoln with humor, human sympathy, faith in God, the presidency of the United States, the Civil War, and the emancipation of slaves, is both ethically and politically useful and furthers useful apperception. But the association of Meade, Pennsylvania Reserves, Pickett's charge, and the Peach Orchard with Gettysburg is useful to citizenship without being helpful to apperception. The component ideas in this latter group should be recalled as long as Gettysburg continues to be an illustrious example of American courage and endurance, and hence a highly useful factor in cumulative impression; but, neither singly nor as a group, are they many-sided enough to the ordinary individual to have been memorized from the standpoint of varying apperception alone. They constitute a group that is to be remembered, not one to think with or even to remember by.

Most of the outlines that learners are compelled to plan, record, and even to memorize, as a condition to further advancement at every stage of their educational progress, are useless either for direct furtherance or varying apperception. A detailed outline of the life and work of a particular author, the industrial resources and political and social conditions of a particular country, the events in even a great military campaign, expend the memory in place of assisting it, and tend to develop unimaginative individuals, who can think only by recalling the concrete thing which they have thought out before. Put to the test for relative value, its restricted usefulness is immediately apparent. Even though it may be inherently interesting, it is neither many-sided nor recurring.

The waste-  
fulness of  
memorizing  
outlines  
neither  
many-sided  
nor recur-  
ring.

The ideas that are directly useful within each academic subject must be grouped, both for direct and for indirect usefulness, into sequences and systems that are both many-sided and frequently recurring. Within most branches rich in content, not only citizenship, health, or morality, but varying apperception both in the sense of concentration and of interconnection may be furthered by directly useful groups formed from ideas directly useful. In all but the abstract subjects, interconnection is furthered by the system peculiar to the branch of knowledge itself, in proportion as its component groups are many-sided and recurring whether they are directly useful or not. Even in specialization with its grouping and organization of details without regard to their direct usefulness or to varying apperception, the test of many-sidedness and recurrence is still determining and varying apperception may be furthered without the branch as well as within it.

These general systems with their subordinate groupings, while in themselves constituting separate and individual apperception centers of high value, multiply both their centripetal and centrifugal power, if they are combined and interrelated. When their interrelationship is based

solely on the systems peculiar to various branches of learning, phases of direct preparation for life and specialization in occupation or knowledge, apperception takes the form of specific and general discipline, and gradually results in the dominance of fixed ideas and habits. Through them the old idea or experience needs to be always apperceived in the same relationships, and the new one to be promptly subordinated in some limited "circle of thought." In general education such dominance is essential only to the directly useful apperceptive groups and systems. Religion and morality, health, industrial efficiency, social service, good citizenship, and right avocation, themselves usefully interrelated, must, so far as possible, regulate and control human existence. To them, from the standpoint of centripetal apperception, academic and specialized systems must be subordinated. Their selection is the most important service to which the test of relative usefulness is put. Their many-sidedness, recurrence, and sensational and emotional appeal, potentially the highest, must be made actual through instruction and experience.

But, aside from their direct usefulness, they combine, with academic organization and all other possibly useful relationships, to ensure, on the one hand, their own varying apperception, and, on the other, the means to the interrelationship of every idea and experience with any other. To this end, the ordinary and incidental application of Herbartian correlation and the five formal steps is too specific, and, therefore, limited, a means. However numerous the specific relationships formed between various branches of human knowledge, and ensured through preparation, presentation, and the other apperceiving activities to each useful idea presented in a recitation, the vast multitude of interrelationships possible to experience are but slightly furthered. Still less is their probability increased if the associations and

Only direct preparation deserves dominance through cumulative organization.

Correlation between academic branches inadequate for useful apperception.

correlations are artificial and temporary—music associated with nature study by calling the bar a fence, and the notes of the scale do-birds and re-birds, or all the elementary branches with each other, by making Mary's Little Lamb the correlating basis of a day's round, or the story of Crusoe the general apperceiving system for a term.

With the exception of the great systems of ideas cumulatively developed from the standpoint of direct usefulness, the most many-sided and frequently recurring systems of interrelationships, and hence the most effective basis for complete and varying apperception, are not far-fetched associations between formal subjects, but the more general phases of personal experience, together with historically related periods, reigns and epochs, and geographically related localities, features, and sections.

**General location, sequence, and phases of personal experience the most useful apperception centers.**

Their value to apperception lies in the fact that, when an idea is associated with them, it is put into mental juxtaposition, with a multitude of others with which it is almost certainly seen to have something in common which would otherwise remain undiscovered. While the interrelated systems of directly useful apperceiving centers limit and control apperception, those of general experience and geographical and historical location and sequence open the way to an apperception as variable as human life itself. More than this, inclusion in particular historical and geographical environments, and even in particular phases of personal experience, is very likely to be based upon essential similarities which juxtaposition makes it easier to discover. If early in life, however, every-day experience and historical and geographical systems come through instruction to include certainly what is consciously associated with direct furtherance, a multitude of ideas which they generally locate and retain are given higher probability of becoming directly useful as well as of being miscellaneously apperceived. In these larger interrelationships many-sidedness and recurrence are determining, and result in an interest of their own. The general

conditions essential to a manufacturing center, the ideas common to a geographical description of any country or of any staple of commerce; the general sequence or classification of events in colonization, war, or epochs, reigns and administrations; the various branches of literature as parts of literature in general, the association of the names of authors with the branch to which they belong and the books that they have written, the classification of facts common to the life and work of all authors; sequences of essentially related facts and principles in science; these are groups many-sided and recurring enough both to remember by and think with. They will be committed to memory not as directly furthering the aim, but as constituting means by which ideas will be interconnected and apperceived.

In the determination of the apperceiving centers most useful for each stage of development, immediacy of sensational and emotional appeal, as well as of many-sidedness and recurrence, must be taken into account. But at every stage, immediacy of many-sidedness and recurrence are determining.

Individual personal experience is not organized through instruction, but organizes itself, except in so far as it increasingly comes to be dominated by direct furtherance. But instruction must at each stage of development select the phases of experience to which a many-sided optional content is to be presented. That is, instruction determines the parts of systematic experience that are to be formally utilized as centers for varying apperception. If the fern is not presented in the more many-sided group of trees, flowers, and plants, with their suggestion of growth, decay, the need of proper care and a constantly increasing number of other ideas, the young child, if it retains it and apperceives it at all, may think of the less many-sided and suggestive "pot of green feathers." The nutmegs in the shop windows may be "white peanuts," if they are not given a far greater likelihood of many-sidedness by being apperceived as "spice"

**Instruction must select the personal experience to which it relates content.**

that is brought from far away. Incidental apperception should not be wholly left to incidental experience. Instruction should assure initial apperception through the greatest manysidedness and most permanent recurrence that are immediate.

The most peculiar service of experience to varying apperception, however, consists of an external and accidental juxtaposition of ideas wholly due to its incidental nature. An idea once associated with a frequently recurring and many-sided apperceiving group is, through its happenings, coincidences, and illogical combinations, brought into relationships only less variable than the vagaries of a dream. Instruction should associate the optional material which it presents with the apperceiving groups common to actual personal experience in which it is certain to be directly or indirectly useful. This accomplished, the accidents of experience may, through some one relationship in all the many-sidedness of the apperceiving group, bring the new material into contact with an idea to which only accident or the providence of God himself could relate it. Many of the relationships most useful to modern civilization have been accidentally revealed—Watts, through the teakettle, and Newton, through the falling apple, each gained a great thought that would not have been possible if steam had been associated only with physical laws and not with teakettles, or gravitation through too pure a science with experimental apparatus in place of with every-day phenomena.

**Experience  
useful  
through  
accidental  
and even  
absurd  
juxtaposi-  
tions.**

So a foreign product, instead of merely being grouped with other exports in a list having only a narrow and specific usefulness, if associated as a domestic import with the use to which it is put, will have a better chance of being known in some new relationship. Each scientific principle apperceived through its most frequently recurring applications, each moral law or ideal of citizenship associated with what is most common in actual experience will through chance be put

into connections which instruction cannot anticipate and which failure to relate academic subject matter to life would make impossible.

Similarly, the idea that is initially associated with some general part of the complete historical or geographical apperceiving systems is given a vastly increased chance of being connected with anything that the learner knows and comes to know of the accidents and essential relationships of world experience since the dawn of history. Once associate a name, a fact, or an activity with the Age of Queen Elizabeth, the coal regions of Pennsylvania, China, the French Revolution, the Mediterranean region, or the Civil War, and impressions, partial remembrances, and certain relationships which it may share come crowding into the mind to ensure a many-sided apperception and to encourage the identification of the general stimuli involved in general discipline.

These certain and specific associations through geographical and historical contiguity are equally essential to direct preparation for life, culture, and discipline, but are commonly memorized no more thoroughly or retained no more persistently than the thousand and one more or less significant facts which without them are far less likely to be useful. Persistent drill in general, as distinct from exact location, should figure in each stage of education.

Exact location, either by date or point of the compass, usually makes no material addition to the number of details that may be usefully associated with it, and should be memorized only when it does. As each advancing stage of education increases the number of details that may be associated, increasingly exact location may, though not necessarily will, become necessary. Only the specialist need commit to memory in chronological order the names of Merovingians and Carolingians or the relative location of the provinces of France. They are many-sided and recurring to the historian and the Frenchman, but not immediately many-sided and recurring to the majority of learners.



This drill in location should not be confined to the formal study of history and geography. Although in literature and art an æsthetic appreciation is possible which merely discriminates between the relatively good and the relatively bad, it remains difficult to develop and retain in the absence of the identification of the masterpiece with its creator, and relatively unintelligent and non-suggestive, if unassociated with the period of civilization, and even the nationality and the century, which inspired it. As already pointed out, the names of artists should be mechanically associated with their masterpieces, and of authors with their characteristic works; essayists should be associated with essayists, novelists with novelists. It is as important, from the standpoint of culture and direct preparation for leisure, to mechanically retain in chronological order the names of German composers, Italian painters, and French dramatists, and in the college course itself the names of Elizabethan poets, as for the specialists to know lists of hydrocarbons or theorems and corollaries in logical order. No name of a pre-eminently great writer or artist or of a pre-eminent masterpiece of literature or art which continually recurs in public library, art gallery, and museum, or even popular periodicals and the public press, should remain unassociated with historical period or epoch, race, nationality, and general geographical locality.

**Artists and masterpieces should recall type of production, nationality, and epoch.**

The initial memorizing or the drill necessary to the retention of such material is as certainly the work of the college and professional school as of schools that are more elementary. The college must not refuse to retail "second-hand" material through a "general information course" on the ground that a "lively man might find it for himself" by a judicious use of the dictionary or the encyclopedia. Its function is to make the "lively man," not to take him for granted. It must not leave to chance the occasional but persistent review necessary to the retention of

**Such association as truly the work of college as of secondary school.**

the specific relationships which the self-active man must remember by and think with.

Any idea, if in itself many-sided in the highest degree in potentially useful relationships, made permanent by continual recurrence in every-day experience or through the persistent repetition of memory drills, may serve as the basis for retaining new ideas and for giving them the greatest likelihood of being fully apperceived in relationships which will further general culture, general discipline, direct preparation for life, and even specialization itself. They differ from the ordinary mental content, which may happen to be as many-sided, in the fact that, selected because they possess the greatest number of potentially useful relationships, they are to be made, so far as possible, common to all individuals for the sake both of furthering the common knowledge, activities, and culture essential to democracy, and of constituting selected and specific relationships through which all new ideas will not only be associated, but definitely associated.

For example, it matters much, both to certainty of retention and probability of further useful apperception, whether the story of the Prince and the Chief Justice is incidentally connected with a particular book, a pleasant afternoon, or a children's magazine, or specifically associated through instruction with England, the fifteenth century, and good citizenship. The two phases of the service which this specific apperception performs are well illustrated by the game of twenty questions. Starting in ignorance of the thing selected by one's opponents from the whole mass of possible ideas, the player successively determines that it is English, medieval, a person, a prince, and almost certainly guesses the Black Prince, one of the Princes in the Tower, or Prince Henry. Reversing this process, and starting with Henry, the possibility of associating him with many other ideas steadily increases as you relate him to prince, English, medieval, and other terms about which a thousand other ideas cluster.

**Directly  
useful sys-  
tems make  
all many-  
sidedness  
useful.**

The incident of the Prince and the Justice may be remembered just as certainly by association in one mind with Dicken's "Child's History of England," and in another with the story of the "Prince and the Pauper," but it is not potentially as useful as if it were associated in both minds through "medieval" with chivalry, feudalism, gorgeous costume, heraldry, tournament, knightly faith, free cities; through "English," not only with honesty and justice, Henrys and Edwards, Magna Charta, parliaments and barons, but with every English idea and event that each individual happens to remember from the coming of the Saxons to the coronation of Edward VII. If it is held in mind, with such miscellaneous connections made as probable as possible, the mind is far more likely to perceive inherent relationships between it and other faithful justices, other just and honest princes, the popularity of royalty, confidence in the impartiality of courts, obedience to law and the doctrine of equal rights, than if it is remembered through association with another story or book.

Obviously, however, the sum total of ideas presented to the mind through formal instruction cannot be made certain in such connections. Individual, incidental, and, therefore, varying associations and apperceptions will be far more largely responsible for the certain recollections, the mere remembrances, and the impressions which form the greater part of education. It is the place of formal instruction to see, first, that these basal mnemonic and dynamic groups and sequences are themselves certainly fixed in mind, and, second, that the new ideas are presented as often as possible in relation to them. The part of the time effective for certain memorizing and retention that need be devoted to this mnemonic and dynamic drill is relatively small. Probably less than five or ten minutes a day throughout the entire educational course would be quite adequate. But it is as necessary in the college, professional school, and university as in the high school or the lower grades. It may properly

**Instruction must ensure association with the most useful apperceiving centers.**

be beneath the dignity of the college professor to serve as the drill master, but the drill master or, at least, examiner must be found, whether in professor or preceptor and tutor. So essential a basis for many-sidedness and interrelationship must not be taken for granted or left to chance.

The optional content most useful to apperception is largely identical with that most useful to mere remembrance. With

**Efficiency of essential content dependent upon the usefulness of optional.** both directly and indirectly useful apperceiving centers and systems certainly fixed in the mind of the learner, the extent of the many-sidedness of varying apperception depends upon the relative usefulness and the quantity of optional material, and, so far as the recitation is concerned, the efficiency of the method through which it is presented. It is at this point that the Herbartian contribution to method has been most helpful. The "five formal steps" are steps to apperception, and, in the absence of memory drill, usually to varying apperception, though "preparation" determines the associations in experience through which instruction seeks to retain the new idea. In the absence, however, of the constant drill necessary to the dominance of a particular group, even "generalization" and "application" may serve no further purpose than the temporary association of a few ideas insufficient to create an apperceiving center. Every new association, however apperceived, even though temporary, tends to completeness of mental interconnection, and so favors both varying apperception and general discipline.

From the quantitative standpoint, each foreign language, thoroughly enough acquired to be pleasurably read or orally

**Ready use of foreign languages a great aid to varying apperception.** comprehended, may be made an effective instrument to varying apperception through untranslated literature, business, travel, and even occasional letters and conversation. As has been already demonstrated, aside from direct usefulness in business, avocation, and academic or vocational specialization, it is through varying apperception, and not through general discipline, that the mastery of a foreign

language is useful. The study necessary to its mastery, however, involves a specific discipline peculiar to the language itself, and intellectual habits which can become general, but are little likely to become so through it. As for other academic subjects and systems, if imperfectly and temporarily mastered, they make contribution, though not necessarily very useful contribution, to optional material. If thoroughly and permanently mastered, they become apperceiving centers and systems which are directly useful if included in direct preparation or specialization, and are indirectly useful through varying apperception in proportion to the many-sidedness and recurrence of their subject matter.

#### 6. *Application of the Test for Relative Value to General Discipline*

Certain of the relationships most useful to general discipline have either been already determined in the application of the test to cumulative impression and varying apperception, or will form a part of what is specifically useful to direct preparation. But, while a relationship or group of relationships may be specifically useful enough to some phase of direct preparation to be made certain, before it is selected as a center for cumulative impression and varying apperception, with a view to general discipline, its stimulus must be determined in as general a form as is most useful through its many-sidedness and recurrence in fields of experience other than that in which it is developed. For example, obedience will undoubtedly be included among the relationships most useful to morality, industry, and citizenship, but obedience to what? In morality its stimulus is individual judgment of right, backed by a moral code and all custom accepted as essential to the well-being of the community that is not wrong for the individual. In industry it is every command or direction of the employer which pertains to the employment; in citizenship, law or the legal command of legally constituted officials. Each stimulus to obedience, which

The determination of the stimulus general enough to be most useful.

forms these various relationships with it, is plainly many-sided enough, and frequently recurring enough in each to be certainly mastered in each in all the specific relationships essential to general discipline. Indeed, the mastery of all will further the application of each in its separate field of usefulness. Each general stimulus to obedience must then be identified as generally as possible in the field in which it operates. It, with the specific relationships necessary to ap-

**A generally  
useful habit  
must have  
specific gen-  
eral stimuli.**

plication, must become a part of the complex system of ideals, information, activities, and habits essential to morality, industry, or citizenship. But obedience to morals, to employer, and to law must be identified with the still more many-sided and frequently recurring obedience to any command or direction not in itself evil, given by one who has the right to command. Here is the relationship which is most useful because it adds to its many-sidedness and recurrence from the standpoint of morality, industry, or citizenship, a still wider many-sidedness and recurrence in useful relationships from the high concept of obedience to the will of God or to the example of Christ, to boyish obedience to the captain of the nine or the eleven and the notion of fair play in all sport. In any one of these relationships the habit of obedience may be firmly formed, and from any one of these it may fail to carry over. The weakness in dependence upon "general moral habit," as against the specific development of moral habits essential to industry or citizenship, is that habits, including moral habits, are not general at all. The greatest likelihood of general application lies in certainly associating with each useful consequence, in addition to its most general stimulus that is useful, each stimulus that is useful in high degree in some specific field. And to both general and specific stimuli, the test of many-sidedness, frequency, and sensational or emotional appeal must be applied.

On the other hand, the stimulus most general within each specific field should be consciously, certainly, and persistently associated with the stimulus which is most useful

for all, in order that the cumulative impression developed through all can be brought to bear upon each. Obedience to law will not necessarily result from obedience in home and school, obedience to employer, and obedience to moral judgments, but good-will toward law, the wish to obey it, will be tremendously re-enforced if its stimulus is identified with obedience in general, and so associated with a cumulative mass of ideals, feelings, imaginations, knowledge, actions, and habits which are applicable to all forms of obedience.

**But all must be identified with the most generally useful stimulus.**

With the exception of varying apperception, and the habit of analysis and synthesis on the recognition of any part of each general stimulus with a view to its identification as a whole, all other conditions favorable to general discipline are specific, and must be included in direct preparation within the field of application. Here, again, is abundant reason for including the development of essential moral habits in direct preparation, in place of hopefully depending upon the application of moral habits developed elsewhere. The determination of the particular fields, in which the useful many-sidedness and recurrence of the stimulus are highest, determines the fields in which detailed knowledge is to be acquired, the habits of analysis and synthesis made certain, and the habit of seeking possible applications formed. The relative many-sidedness and recurrence of particular details of knowledge, as a condition to application, determines which are essential. It is the many-sidedness, the recurrence, and even the sensational or emotional appeal of a particular application that determines whether it is sufficiently useful to be associated as a "type" of similar applications. Even the particular habit which is to be made certain and sure, as the basis for all the complex associations favorable to its general application, must be selected on the ground of the relative many-sidedness, frequency, and emotional appeal of its general stimulus.

**All relationships essential to application determined through their relative worth.**

To continue the illustration, take obedience to law as a factor in citizenship. The basal habit of obedience, whether in the home or elsewhere, cannot be taken for granted. Obedience to some stimulus or other must be made sure for every pupil of the school. What is so fully under the control of instruction, and, at the same time, more immediate in its many-sidedness, its recurrence, and its emotional appeal as the law of the school? From the standpoint of citizenship, however, the general stimulus of which the pupils are made habitually conscious must not be love of teacher, the hope of reward, the fear of punishment, rational conviction of the necessity of particular rules, the fact that they have been made by the school itself as a self-governing body, or even the presence of authority which has the moral right to command, but the naked fact that the law of the school is the law of the community and the state created by legislature and school board, and that the teacher is a legally constituted officer of that law. All other motives to obedience must unite to re-enforce the incentive of legality, but no one of them can be substituted for it. The teacher may be hated, reward scorned, punishment defied, the necessity for rule unappreciated, self-government betrayed, and moral motive undeveloped, but the law of the school as the law of the state must be obeyed. No boy should be expelled or suspended from school, to be educated into outlawry through successful defiance of law, and to become to other pupils an impressive example that law can be successfully defied. On the contrary, his removal to some special institution or school where obedience can be effectively compelled should keep him in the habit of obedience to law, and accustom both him and his companions to the inexorability with which it is compelled.

Continual identification of obedience to law, with the more general stimulus of any command given by one who has the right, performs the double service of re-enforcing the stimulus of law by the cumulative force of all other motives, and of



adding its force to theirs, but obedience to law must make a cumulative impression of its own. From the standpoint of citizenship, it is not only necessary to obey the law, but to obey the law because it is the law. So, with due regard for the test of relative worth for the sake of cumulative impression, a few highly emotional illustrations are selected to be specifically and certainly associated with it as an emotional center for a gradually developing will to obey the law: the judge who condemns his own son, Gascoigne and Prince Henry, Christ and the tribute money.

To these must be continually added incidents and examples relatively impressive, many-sided and recurring, which, though themselves forgotten, will strengthen the common feeling of regard for and pride in obedience to law. Furthermore, such many-sided and frequently recurring ideals and habits of obedience as have been formed in the home should be made legally potent through persistent emphasis of the fact that the teacher stands in loco parentis.

Similarly, the test of relative worth must be applied with a view to mere remembrance and to varying apperception. With the ideal of obedience to law must be specifically associated the periods and the localities in which it is likely to have the most frequently recurring, many-sided and impressive relationships: the Roman Empire, the age of Justinian, the development of the British constitution. In addition, there must be brought to bear upon it as many as possible memory and apperceiving centers, less many-sided and recurring than democracy, habeas corpus, trial by jury, and other concepts that must be certainly memorized, but more many-sided and recurring than those which might be referred to or discussed: the common law, constitutional law, the canon law, despotism, anarchy, limited monarchy. These concepts whose lack of immediacy in many-sidedness and recurrence makes them the partial concepts and mere remembrances of the lower stages of advancement, become the concepts that must be fully comprehended and definitely and certainly associated in the more advanced grades.

For the remaining conditions to the general application of the habit, specific discipline is solely responsible and the test of relative worth still more obviously applies. It is specific discipline that must certainly associate with law, as the stimulus to obedience, the few acts of obedience which will be most frequently recurring and many-sided for those who are being taught. With some schools it may be prevention of the defacement or destruction of property, public order during a strike, or observation of the law concerning the collection of refuse; with others, it may be the prevention of smuggling on returning from a trip to Europe, and the observation of the speed laws on the public highway. The associated applications will vary with locality, school, and grade, many-sidedness and recurrence always being determining for locality and immediacy for grade. With the general stimulus must also be certainly associated such frequently recurring and many-sided fields of application as business, public health, property and person, together with the most many-sided and frequently recurring terms associated with each: receipt, contract, protest, levy; fumigation, health inspection, quarantine; trespass, lease, ejectment, damage, distinction between real and personal property; self-defence, resistance to an officer, assault and battery, perjury, and right of search. These are but a few examples of the terms which, immediately many-sided and recurring at various stages of educational progress, will aid in carrying over the habit of obedience to law if cumulative impression has created the will to make it general.

Finally, it is self-evident that the selection of the general stimulus which is most useful, or of the most useful fields of application, is also determining for the habit of seeking out applications while in school, the habit of analysis and synthesis in particular fields, and the habit of analysis and synthesis with a view to the identification of the stimulus as a whole on the recognition of any of its parts. That is, the general test for relative value can be used not only with a view to determining the habits and relationships which should

be applied in other fields than those in which they are made certain, but to determining the various relationships which most effectively aid in carrying them over. In direct preparation involving moral or intellectual habits generally useful, the memorizing of these latter relationships must include those essential to the general application of habits in all fields of experience in which they are useful. This follows not only from the desirability of carrying them over into other fields, but from the necessity of re-enforcing them in each specific field in which they are certainly developed, with the sum total of influences which tend to make them stronger than possible alternatives. Obedience, truthfulness, honesty, promptness, punctuality, industry, perseverance, endurance, bravery, and their common personal and social factors, self-control, self-respect, consideration for others, the respect of others, love and self-sacrifice, whether developed and exercised in school or out, are always opposed by conflicting tendencies and habits, and need in any one field of experience the cumulative re-enforcement from all others in which they have become dominant. Their general application within each is dependent upon the certain memorizing or habitual operation of specific relationships relatively most useful to general discipline, including not only cumulative impression, but the whole group of favorable relationships just illustrated in discussing the general application of the habit of obedience. And the certainty of their application in each and the probability of their application in all is increased by each addition of the circle of specific relationships favorable to application in any one.

**The test determines both the most useful habits and the relationships favorable to their application.**

From the standpoint of general discipline, then, it is as necessary to apply the test of relative worth to the relationships which constitute favorable conditions to the broadest useful application of a habit as to use it in the determination of the basal habit itself. That the basal habit may be academic and certain of development in the mastery of a particular branch is no reason for developing it there as

a step toward general discipline, unless its subject matter also furnishes the relationships necessary to its carrying over into other fields, or special provision is made through other subject matter and the life of the learner in school and out, to ensure its carrying over. A system of specific relationships, quite distinct from any academic system, but equally complex and equally subject to the test of relative worth, is essential not only to direct preparation for life, but to the general application of each generally useful moral or intellectual habit. Without direct and specific preparation for life, general discipline is at its minimum for the habits which academic training has made most sure.

Since a branch of study as a systematic whole cannot be usefully applied outside the field for which it is specifically organized, its usefulness as a whole to general discipline is limited to its contribution of specific relationships which are to be carried over and the ensuring of cumulative impression and varying apperception necessary to general application. The inadequacy of the abstract subjects from this point of view, outside the province of specialization, has been cumulatively emphasized. It is the rich subject matter of natural science, history, literature, and art which not only affords the material for directly useful organization, but which, through the organization peculiar to each branch as a whole, furnishes the apperceiving and memory centers and systems which further general discipline through varying apperception and mere remembrance.

There are, however, certain habits which the test of relative worth will show highly useful, from the standpoint of general application, that are dependent upon the mastery of complex and systematic bodies of knowledge. The habit of *progressive* or cumulative analysis or synthesis which is necessary to the building up of complex logical wholes, of exact thinking, which passes from initial premises to conclusions which in time become premises, of

The conditions favorable to useful general discipline form a system distinct from academic system.

General moral and intellectual habits cannot be developed in an abstract environment.

industry, exactness, persistence, and patience in complex and abstract endeavor, form a necessary part of the mental and spiritual equipment of all great thinkers. The acquisition of such habits, however, is a phase of specialization. Since the individuals whose specialty demands them, whether it is vocational or liberal, will, from the same standpoint of direct preparation, just as certainly require mathematics and the languages, such carrying over as may be incidental to "formal" and abstract study will result. But in the course of preparation for life in general a far different application of these intellectual and moral qualities is essential. If the patience and persistence which are equal to material that reacts against the worker through twistings and turnings, splittings and breakings that seem to make it perversely alive, or which overcome animate nature whose stupidity or folly, unfriendliness or wickedness make perversity real, are not of different quality from the patience and persistence involved in the analysis and synthesis of lines and symbols, they at least represent application in so different a spiritual environment, and with so much stronger alternative impulses, that they must be separately developed. The moral or intellectual habit that triumphs over conflicting impulses and incentives must be something more than a by-product of academic achievement or even an essential condition to it. In order to have the inexorability to conquer material resistance and human opposition and temptation it must be made "stern" and strong, not merely from facing the complex problems involved in the mastery of great systems of thought, but from having the cumulative re-enforcement of a great intellectual, emotional and motor system of the application of which it is a part, and upon which its general application directly depends. In every-day life the spirit and the habits of science should be continually applied, but they are most certain of application when they are acquired through those parts of science that are not only organized as science, but in systematic relation-

**The cumulative systems essential to direct preparation ensure them.**

ship to life itself. For the great mass of mankind it is safe to conclude that direct preparation will not only develop the moral and intellectual qualities most general in their usefulness through the recurrence and many-sidedness of each essential relationship best fitted to their perpetuation and general application, but, through a sufficiently systematic and complex subject matter, to ensure the "stern" resistance to application which Dr. Kerschensteiner finds lacking in academic elementary school work.<sup>85</sup> The industrial training, in the sense of manual training, which he urges as the elementary substitute for the complex organization of more advanced studies, can be more truly regarded not only as a part of a highly organized direct preparation for morality or citizenship, but as a part for which the test of sensational appeal will not be determining in the absence of many-sidedness and recurrence useful to learners who are not specialists.

Although he is safe in assuming that elementary and industrial manual training may result in the spirit of cheerful co-operation, it does not follow that, by industrializing the school, he has developed the cheerful spirit and basal habit of co-operation essential to good citizenship. He will find it hard enough to carry over his cheerful co-operation, resulting from an immediate interest in an exceptional and personal task, to the monotonous grind of putting on boot-heels or polishing watch cases in an employer's factory. It is a still farther cry from individualistic occupation or cheerful co-operation in the making of a heel as part of a shoe that never will wear itself out on a workman's foot, or the polishing of a watch case that never will be scratched in a workman's pocket, to cheerful payment of one's just part of a public tax or cheerful co-operation with the police force when the shop is shut down by a strike. From the standpoint of civic, as distinct from industrial training, better the more direct preparation of Miss Wister's League of Good Citizenship, with its cheerful co-operation in cleaning school grounds

and protecting private and public property,<sup>86</sup> than that of the manual training school, in making a desk or a book-rack to be displayed in the principal's office.

The ideals, the partial concepts, the many-sidedness, and the habits, equally essential to direct preparation and general discipline, when once selected must be more specifically and certainly organized in every phase of direct preparation than in the academic branches whose organization is in part at least included in it. Including, as they then will, both the relationships which are to be generally applied and the relationships through which application is made most certain, they must be as complex in their direct usefulness as a pure science in its abstraction.

On the other hand, it can safely be asserted that the most thorough study of even a formal branch, in the absence of the certain memorizing of relationships quite external to its logical organization, far from carrying over the resulting habits into other fields of experience, will fail to result in general discipline within the formal branch itself. The great mass of pupils in arithmetic are still confused in the face of miscellaneous examples, and students in geometry are yet helpless when confronted by original theorems and problems.

**General discipline within an academic branch dependent upon memorizing relationships external to it.**

To illustrate, a student may know every proposition regarding the relation between lines and angles and the equality of triangles, and still be unable to demonstrate the simplest original theorem involving them. Given the fact that one angle equals another or is to be proved equal to another, he must not only know the preceding theorems and their demonstrations, but he must have firmly associated with the notion of equal angles every way in which they have been demonstrated equal—exterior-interior angles, alternate-interior angles, vertical angles, right angles, corresponding angles of equal triangles, opposite basal angles in an isosceles triangle, superimposed angles, angles equal to a common angle, etc.

Similarly, with the notion of equal triangles, he must have associated triangles having two sides and the included angle equal, three sides equal, coincidence on superposition, etc. These relationships—conditions to general discipline within the branch, which many teachers of geometry do not drill into the minds of pupils—are far more many-sided and frequently recurring than the theorems themselves, which, when systematically memorized, collectively constitute a thoroughly adequate specific discipline. So with the habit to which they are a condition, the habit of progressive analysis and synthesis, with a view to the identification of each familiar stimulus, and consequently the drawing of every formal conclusion which is possible at each new stage of the demonstration or solution. Quite outside of the formal subject matter of geometry, and not necessarily involved in the mastery of theorems whose demonstration is given by the text-book, are specific relationships and habits, in the absence of which independent general application within the geometrical field itself is improbable. The relative fewness of the specific relationships and habits essential to general discipline in geometry, presents sufficient contrast with those essential to the general carrying over of a moral habit, both to indicate why an abstract subject is least likely to be in itself adequate to general discipline in other fields, and to suggest the fact that relationships vary greatly in the sum total of specific associations and habits necessary to make them as general in their application as is useful and possible. But each relationship, useful enough to be generally applied through the independent self-activity of the pupils, must have specifically associated with it other specific relationships and habits, essential from the standpoint of general discipline, whose relative worth is determinable, like that of the general relationship itself, by their relative many-sidedness, frequency, and sensational or emotional appeal.



## CHAPTER IX

APPLICATION OF THE TEST OF RELATIVE WORTH TO SPECIFIC DISCIPLINE, WITH THE CONSEQUENT DETERMINATION OF A CUMULATIVE AND DOMINATING SYSTEM, BOTH DIRECTLY AND INDIRECTLY USEFUL

### 1. *Specific Discipline as Essential to Formal Self-activity as to Direct Preparation and Specialization*

PERHAPS the most important fact that has been cumulatively demonstrated in the preceding discussion is that the indirect furtherance of the educational aim, through the various phases of formal or educational self-activity, demands a system of specific relationships and habits quite distinct from the various branches of human knowledge organized as wholes, or the even more complex and certain systems essential to direct preparation for life. While thus distinct from both specific academic learning and specific preparation for life, it is a necessary part of each, and each must furnish the basal relationships which it should make general, and with which its peculiar relationships must be specifically and certainly associated.

Hence, from the standpoint of specific discipline, the relationships essential to the usefulness of cumulative impression, mere remembrance, varying apperception, and general discipline are of the highest value, and must be made as certain and enduring as those directly essential to life or to academic specialization. Ignored in text-books, omitted from courses of study, neglected by the mass of teachers, they constitute the only means to the independent self-activity which is the ideal of the new education. Before the human mind can independently remember and] think in the most useful relationships, it must have certainly, cumula-

**Mechanical repetition essential to intellectual and moral freedom.**

tively, and systematically mastered the relationships which it can most usefully remember by and think with. The slavery of imitation, memorizing, drill, accumulation, and review must precede and accompany intellectual and moral freedom.

Specific discipline includes:

(1) The specific relationships and systems essential to formal self-activity which have just been discussed and illustrated. While distinct from academic learning, they include the general relationships essential to some academic branches as wholes, such as general geographical and historical location and sequence, and many-sided and frequently recurring terms and principles.

Specific discipline includes three distinct but connected systems of specific relationships.

(2) The specific relationships and systems essential to direct preparation for life in general. Their determination through the application of the general test for relative worth will soon be discussed and illustrated under different phases of the educational aim. They include many particular academic relationships, and occasionally academic branches in part or as wholes, such as portions of civil government from the standpoint of citizenship and general elementary science from that of industrial efficiency. With these and the relationships necessary to such general application as is useful, they constitute more complex systems than the academic branches themselves.

(3) The specific relationships and systems essential to specialization. They include all academic branches as wholes when mastered with a view either to academic or vocational specialization. Within the subject matter of each branch regarded as a systematic whole, as well as for particular relationships that further the specialty, the test of many-sidedness, recurrence, and emotional appeal is determining.

In most existing courses of study the specific relationships and systems essential both to formal self-activity and to direct preparation for life are given only in so far as they are naturally included in academic subjects. Science, literature,

history, and civil government, for example, however academic the selection of their subject matter, contain a varying amount of material of direct worth to citizenship, morality, or industry. History and geography present the general sequences and locations in time and space favorable to mere remembrance and varying apperception. But the most "formal" or disciplinary subjects of them all fail to include as an essential part of their subject matter the relationships favorable to general discipline.

The application of the general test for selection, within and without existing text-books and courses of study, should result, first, in a sharp contrast between specific relationships and grouping, most useful, either in direct preparation or academic specialization, and those relatively less useful; second, in the determination of those so essential that they must be certainly memorized and generally applied, and eventually through indication of the relationships most favorable to such application, in the building up of inter-related systems of thought and action that will dominate life and character.

## *2. Application of the Test to Direct Preparation for the Various Phases of the Educational Aim*

Where the test of relative worth has been applied to specific discipline, as it already has been to the other phases of formal self-activity, it will be still more clearly evident that, whether the several phases of the educational aim are to be directly or indirectly furthered, the means of determining the relative worth of relationships remain the same. Indeed, theoretically, it can be used to determine the relative usefulness of the various phases of the aim themselves, through their relative many-sidedness and recurrence, both in the present or an ideal civilization, and in all succeeding epochs of social and national development. While the ethical and the healthful, being general in their application to the more specific phases of life, have always

Relative worth of the various phases of the aim itself only theoretically useful.

been the most many-sided and frequently recurring, the extent of even their usefulness has varied, both with geographical location and in the course of human history. Where individuals live crowded together, whether in Eskimo huts or a great city, relationships affecting health are more frequently recurring and many-sided than when they live apart. Where physicians are rare and inaccessible, or their skill is limited, more relationships affecting health are directly useful to those not specialists. Citizenship takes on far more many-sided relationships under a democracy than under a despotic form of government. Industrial efficiency demands far more relationships in complex civilization than primitive life, but demands proportionately less many-sided skill on the part of each individual when industry is highly specialized. Even leisure, as pointed out in discussing culture, is more frequently recurring as the condition of labor is improved, and more many-sided as social life itself becomes more complex. If the relative educational worth of the various phases of the aim is to be theoretically determined, it must be through their relative recurrence and many-sidedness for the majority of individuals in a given country and in a particular period rather than through Mr. Spencer's evalua-

**The relative time devoted to each dependent upon relative difficulty of realization.**

tion based on the contribution which each makes to racial survival. Practically, however, the part that each is to play in the present courses of study is determined more by relative difficulty of realization and efficiency of method than by its relative theoretical worth. As each phase is so essential that it must be realized as fully as possible at each stage of educational development, those that demand more or stronger ideals and incentives, more many-sided knowledge, more complex habits, greater system and more many-sided application, will take up a proportionately larger part of the course of study and of the time available for memorizing, and the time occupied by each will be lessened or increased by the relative efficiency of the methods of instruction which are brought to bear. The relative theoretical

value of the various phases will become determining only in case it shall be found that the time available for formal education is inadequate for the realization of all, and consequently that choice must be made among them. With the course of study limited to subject matter and organization that stand the test of relative usefulness, together with the introduction of effective method, the time available for formal education should be fully adequate. This becomes even more probable if, with a more many-sided course of study which interchanges physical and æsthetic activities with mental work, the length of the school day and the school year is increased for all learners, and, through continuation school paralleling and for half of the day taking the place of industrial occupation, the number of years spent in formal education is extended for those compelled by economic conditions to leave the ordinary school.

With the general interest which has been aroused in direct preparation for life, it is almost inconceivable that the first essential step toward determining the relative worth of the subject matter of instruction—the analysis of general phases of the aim into definite and specific ends—has yet to be taken for citizenship, industrial efficiency and social service, has been so recently taken for health and has been so partially taken for religion and morality.

**Analysis of general phases of aim a necessary condition to application of the test.**

The many-sidedness, frequency, and emotional force with which a particular relationship furthers good citizenship may be determined without analysis, but not the sum total of the relationships which further it with most many-sidedness, frequency, and emotional force. In such familiar terms as patriotism, love of country, obedience to law, political honesty, "cheerful co-operation," and self-government we have the present loose conception of what good citizenship means. It is indefinite, unanalyzed, incomplete. The use of obedience to law, as an illustration of the application of the test from the standpoint of general discipline and of equal rights, as an example of the complexity and system essential to

direct instruction, has already demonstrated how far analysis must go if the test is to be adequately applied. Take, for further example, love of country. No search for emotional material, which is sufficiently many-sided and frequently recurring to most effectively develop it, can be intelligently carried on until it is analyzed into all the definite and specific factors which constitute it. It includes love of country in the physical sense—the love of mountains and hills, rivers and valleys, forests and flowers, gray mists or sunny skies. It embraces the more personal love of home—of “altars and fires,” “green graves,” and scenes of childhood. It extends to pride in national characteristics and achievements—the simplicity and democracy of American life, heroic deeds in war and peace, industrial triumphs, feats of engineering skill, national music, literature and art. It finally reaches confidence in national power and influence, and culminates in love of political freedom and equality for all mankind—the spirit of American democracy. When the general aim is once analyzed into such definite ideals, the test of relative worth is easy to apply. It is not necessary to compare the usefulness of love of country with obedience to law, or even their component ideals one with another. In their specific association together, as general and subordinate phase of citizenship, they are so many-sided, frequently recurring, and highly emotional as to be obviously essential in their sum total. But with their subordinate ends once determined, it becomes easy to apply the test to the selection of subject matter that will not only be relatively useful in developing love of nature, home, and national characteristics and achievement, but in relating it to citizenship.

Since formal self-activity is included in direct preparation, perhaps the greatest aid to analysis of the various phases of the aim is consideration of each from the standpoint of cumulative impression, mere remembrance, varying apperception, and specific and general discipline. Each form of educational self-activity, if it is to be made as useful as possible

**Analysis  
and organ-  
ization must  
be pedagog-  
ical as well  
as logical.**

to a particular phase of the aim, demands the selection and presentation of the relationships which ensure the greatest many-sidedness, frequency of recurrence, and emotional appeal for it, and at the same time specifically bring it into definite association with the particular aim. Recognition of the feelings, the sentiments, the viewpoints, the interests, the ideals, and the public opinion that cumulative impression must create; of the concepts that are, for the time at least, to be partial and merely remembered; of the knowledge and information within the particular phase which most certainly and usefully relate it to every other field of experience and every other field to it; of relationships or habits which must be made specific and sure; of the further relationships necessary to general discipline within the particular phase and without it, potentially assists in analyzing religion, morality, health, industrial efficiency, social service, citizenship, and avocation into definite ends, and in preventing a partial and one-sided attempt to achieve each general phase through the emphasis of some one of its more apparent or more easily attainable ends to the exclusion of others. Civil Government, "school city," or "cheerful co-operation" cannot separately ensure good citizenship. Scientific temperance instruction is not the sole antidote for the social temptations of strong drink. Religion must not remain dogma alone or vague emotion. Education itself must not become merely a point of view. Each phase of the aim must be analyzed into its essential parts, and throughout the course of education the sum total of relationships that are most useful, whether directly or indirectly, must be made certain and permanent. Education, in place of being academic knowledge and discipline, which gradually merge their certainty into a vague culture or point of view, is rather a cumulative emergence of certainty from impression and varying apperception. While at every stage of instruction all of the five forms of educational self-activity are being developed, the impressions and mere remembrances of one stage become more adequate concepts in the next, the partial concepts and varying associations of

earlier years, the habits of adult life, until collectively they form a system which, increasingly certain in its essential parts, and, therefore, increasingly useful in the general trend of its varying associations, determines character and dominates action.

In the case of religion and of morality the analysis of the general phase into particular ends has long been complete.

**Logical analysis of religion, morality, and health relatively complete.** The Sermon on the Mount, twelfth chapter of Romans, and the thirteenth chapter of Second Corinthians eloquently specify the Christian virtues. The Jewish religion largely owes its perpetuation to the definiteness of its requirements, and their continual repetition in accordance with

scriptural injunction. The moral code of all peoples is equally definite and specific. Within the last few years the conditions essential to good health have been scientifically specified and demonstrated. But their further analysis into such definite relationships that the test of relative worth can be applied, together with both the general and detailed analysis of industrial efficiency, social service, good citizenship, and the activities proper to leisure, has been checked by failure to consider the relationships necessary to formal self-activity.

**Pedagogical analysis still lacking for all phases of the aim.** It is not only faith, honesty, cleanliness, legal aid to ignorant or poverty stricken defendants, the doctrine of equal rights, or appreciation of literature that analysis must reveal, but the feeling of faith, the ideal of honesty, pleasure in cleanliness, interest in legal aid, devotion to equal

rights, and a love of literature; the essential vocabulary of each, even where partially understood, and as many words and ideas relating to each as can in varying associations be held in mind; the habits that are basal for each, together with the associated fields of application, typical examples, emotional centers, knowledge necessary to identification, specific stimuli to analysis and synthesis, and all the other conditions necessary to their general application.



Analysis, with a view to thus searching out the specific relationships favorable to cumulative impression, mere remembrance, varying apperception, and general discipline, goes further and is more inclusive than the mere subdivision of general principles into a formal outline.

### 3. *Determination of the Relative Worth of Specific Relationships Results in Specific System*

As the test of relative worth is applied to these definite and specific relationships the inevitable result is system—a system not merely logical, but pedagogical and dynamic. The definite ends into which each phase of the aim is analyzed are co-ordinated, subordinated, and interrelated. In place of comprehensive outlines suitable for the exhaustive classification of details, the groups of relationships proved to be most useful to the various forms of educational self-activity are associated with each. If the most many-sided, frequently recurring, and usefully emotional are firmly memorized and retained not merely through varying apperception, but definite and specific review; if persistent instruction gives continuity in formal education to what experience will give continuity in life, every form of self-activity will result through direct preparation for life, and indirectly as well as directly contribute to it. It is in this sense that moral and religious training, preparation for citizenship, and education for every other phase of life should be formal—not in that of a logically organized body of knowledge. It is this that Jacotot was groping after when he had Telemachus memorized verbatim to become the basis for the retention and assimilation of all other knowledge.<sup>87</sup> It is this, limited to the academic subjects, that in the classroom of Elihu Nott gave Francis Wayland the clue to his “new system,” with its incessant drill upon the fundamental relationships of the various college subjects.<sup>88</sup> It is this, forgotten by the new education in its easier development of apperception and interest, that is, after all, the only

certain means through which all self-activity can be made useful.

System, in this sense, must be sharply distinguished from an outline or mode of procedure that classifies and inter-relates according to some formal logical scheme.

**Pedagogical system sharply distinguishable from logical outline.** Any system, outline, or mode of procedure temporarily aids mere remembrance, and, so long as it is retained in part or as a whole, continues to further varying apperception. Most temporary, and hence, most delusive of all, is the painstaking outline applicable only to the specific details which it has classified. Whether it applies to the facts of a particular year, administration, country, or set of products, or the treatment peculiar to a particular lecture course or text-book, the more elaborate it is, the more readily it is forgotten. Ordinarily, its one possible survival, except such details as it has held in mind long enough for them to be otherwise apperceived and retained, is the habit of outlining, and hence of analyzing, the particular sort of subject matter it included. In case the learners have repeatedly and successfully made such outlines for themselves, the practice may become habitual, though mainly within the particular subject matter alone, unless, as is little likely, the conditions favorable to more general application are ensured. If a particular outline is not too elaborate in its ramifications, and its subject matter is not likely to be held in mind in other relationships, a high degree of many-sidedness, frequency of recurrence, and emotional appeal may justify its retention through persistent review. The mass of the outlines given to learners and required of them, however, "the hammering the facts home," against which President Butler has so forcibly protested,<sup>89</sup> not only substitutes something to be remembered for something to remember by and think with, but something that will not be remembered long.

The same conclusion is less likely to be true in the case of the general outline or mode of procedure common to

a considerable number of particulars. Its delusive phase lies in exhaustiveness and elaborateness. The more "thorough" it is in this sense, the more likely it is to be forgotten. More than this, an exhaustive mode of procedure which includes all details in each case in which it is applied cannot be general, and carries the unnecessary burden of specific parts for which all the limitations of the specific outline hold true. From the standpoint of memorizing and permanent retention its weakness lies in the fact that, both in these specific parts and in those that are general, it is certain to include relationships too little many-sided, recurring, or emotional to be highly useful. Restricted, however, to essential relationships, the general outline or mode of procedure becomes a necessary *part*, though *but* a part of the system whose memorizing, incessant review, and cumulative force constitute direct preparation. For example, take the practice which has been rather popular in the teaching of geography of applying to each country a more or less exhaustive outline, including location, boundaries, area, population, subdivisions, climate, physiography, natural products, manufactures, cities, and all other topics necessary to completeness. It is convenient for a teacher or a text-book maker who wishes to be sure to leave nothing out. If it could be readily retained in school and after school it would constitute a memory and apperceiving center. But it usually contains far too much for ready retention and recall, and includes factors which either apply to but one or two countries, or call for details which are neither many-sided, frequently recurring, nor emotional. Few geographies present subdivisions for the mass of countries. If they do, the most of them, together with such more general topics as area and population, are so little many-sided and recurring in any useful connection that it is folly to either present or retain them. Boundaries are useless to the mass of learners in any more exact sense

Even useful outlines, many-sided and recurring, but a part of pedagogic system.

Application of the test of relative worth to an outline illustrated from geography.

than is involved in general geographical sequence, that is, it is useful to know what countries are adjacent, but usually useless to know the exact curves and limits of certain lines upon a map; still more so, except for the sake of manual dexterity or artistic skill, to draw them neatly. What associations come crowding into the mind of the ordinary student from the fact that Germany's area is two hundred and eight thousand eight hundred and thirty square miles, or five times the size of Pennsylvania, or from whether each little curve of the Rhine is from east to west or north to south, whether the population is fifty millions or fifty-two millions two hundred and seventy-nine thousand, nine hundred and fifteen, or whether it is ten times that of Illinois! On the other hand, if the general outline is limited to a small enough number of topics for them to be readily memorized and retained, topics that are common to all countries, and hence many-sided and frequently recurring, and especially if they stand in essential relationship to each other, their mechanical memorizing as common to all is the most certain guarantee of definite and intelligent work. Climate and physiographical features, natural products, population, industry, and commerce constitute a necessary sequence of topics which ensures not only a means of recollection, but a stimulus to thought and reflection.

An effective pedagogic grouping such as this is a more essential factor in even academic system than exhaustive classification. But in system, organized for direct preparation for some specific phase of life, many such groupings cumulatively combine with other interrelationships which are immeasurably more potential and more certainly "disciplinary" than the logical organization which constitutes academic system. Here relationships are selected on account of their many-sidedness, recurrence, and emotional force, and not for the sake of logical completeness. They are related to each other not as divisions and subdivisions, but as emotional centers, words

**An outline may itself become pedagogic, that is, formal in the true sense.**

and ideas necessary to apperception or application, generally useful stimuli and conditions favorable to general discipline.

Except from the standpoint of specialization, academic branches are included not as wholes, but in their most many-sided, recurring, and emotional parts; not in isolation from each other, but re-enforcing each other wherever they can be most useful, whether in direct furtherance of the educational aim or in indirect furtherance through formal self-activity. This is the true correlation and concentration to which academic correlation and concentration, from the standpoint of a special subject or "remote from life," are at best but a helpful condition. Every imaginable relationship, every branch of knowledge as a whole, is at least a possible means to mere remembrance and varying apperception or a basis for them.

**Academic branches included in pedagogic system through their most useful parts.**

But direct preparation demands, in place of the potentially useful but readily forgotten elaborateness and completeness of exact sciences and of academic branches in general, a certain and permanent system, every relationship of which has not only been selected and organized for its potentially many-sided, recurring, and emotional furtherance of life, but through which such furtherance will become cumulatively more many-sided, recurring, and emotional.

A good example of such a dynamic whole can be given by collectively calling to mind the various illustrations which citizenship has furnished from the standpoint of system and of the various phases of formal self-activity. First, continual consciousness on the part of teacher and learner that citizenship, together with morality, health, industrial efficiency, social service, and avocation, is the aim of the school. No one of these aims must be disassociated with the other; no one emphasized at the expense of the other. With American citizenship must be inalienably associated the idea of love of country, of co-operation for the general welfare, of equal rights; with love of country,

**The pedagogic force of direct preparation illustrated through citizenship.**

the emotional centers and experience which in highest degree further love of natural scenery, of spots hallowed with the sacred associations of home, and of essential national characteristics and ideals, pride in great national achievements in war and in peace; with co-operation for the general welfare, participation in self-government, obedience to law, the payment of taxes, self-sacrifice for the common good, the furtherance of national and international peace and goodwill, safeguarding of public interests, defense of the national honor; with equal rights, equality before the law, equal suffrage, equal participation in public benefits. To each of these definite ends must be specifically added the re-enforcement of general morality, and of the sum total of the feelings and ideals that constitute love of country. With each must be associated such systems of cumulative impression, partial concepts, related knowledge, fixed relationships and habits, and specific and general conditions necessary to application as have been illustrated in detail for equal rights and obedience to law.

It is in the subordinate but essential form of information and related knowledge that academic system plays its part in direct preparation for citizenship and each other phase of life. For example, while equal suffrage must call to mind qualifications for suffrage, woman suffrage, naturalization, the race question, the habit of personally exercising the right, and so on, and each of these, in turn, must suggest memory and emotion centers, specific relationships, and the conditions necessary to general application, there should come with it all in proper association and subordination facts and related groups of ideas drawn in part from academic subjects. To illustrate, qualifications for suffrage should include not only the provisions in regard to suffrage in the United States constitution, but the facts which United States history gives concerning the qualifications for suffrage in the various colonies, and steps taken toward universal suffrage after the Revolution. To this should ultimately be added the story of the English "rotten boroughs," the Reform Bill of

1832, and similar material from modern European history. Since knowledge necessary to the intelligent exercise of citizenship is an essential subdivision both of qualifications for suffrage and of the habit of individually exercising the right, all this must be supplemented by a highly organized body of knowledge concerning qualifications for office and public issues. This embraces not only various sections of civil government, but much historical, economic, sociological, literary, and even scientific material, together with systematic study of contemporary newspapers, books, and periodicals. Resulting from this or added to it is a mass of incidental information including both definite knowledge and partial concepts—Australian ballot, suffragist, plurality, voter's assistants, repeaters, and similar terms.

From the standpoint of system the fundamental question here is, not shall there be a highly complex and specific system of direct instruction organized for citizenship and each other general phase of the educational aim, but shall it include or take the place of academic organization. From the standpoint of specialization and indirect furtherance of the aim, there is no question as to the necessity for the logical schemes of organization peculiar to each academic subject. In the case of indirect furtherance, it must be a general outline of the subject, including, for the sake of varying apperception, such interrelationships as are most many-sided and recurring in every-day life; in that of specialization, if vocational, all that the usual test proves essential, and if academic, the system in all of its fulness and complexity. But the extent to which academic organization figures, in direct furtherance of each phase of the aim embraced in general preparation for life, is determined purely through application of the test of relative worth. While the specific relationships selected become an essential part of a system of direct preparation, they are not necessarily taught in isolation from other subject matter belonging to the same academic branch. On the con-

**Relative worth determines the extent to which academic systems form part of pedagogic.**

trary, if the branch is taught as a whole, whether from the standpoint of indirect furtherance or specialization, varying apperception and other conditions essential to general discipline are effectively served by the correlation which results when the selected subject matter is taught as a part of both the directly useful and the academic systems. From the standpoint of indirect furtherance this is conspicuously true of geography and history, including the history of science, literature, and art. From the standpoint

**Directly  
useful sys-  
tem possible  
within the  
academic  
branches.**

of specialization it is true of any branch of knowledge. In subjects thus taught as wholes, regardless of the amount of directly useful material they contain, the purpose of direct instruction will be most effectively furthered if all essential directly useful material is included and consciously and continually grouped by the learner under the cumulative topics of religion and morality, health, industrial efficiency, social service, good citizenship, and avocation. This in no sense takes the place of the complex specific systems necessary to direct furtherance, but usefully correlates the academic branches with them.

When, however, the subject matter of the academic subjects is taught only from the standpoint of direct furtherance or general discipline, whether it shall be presented as an academic whole or academically organized at all, depends upon the nature and amount of academic subject matter included through application of the test of relative worth. For example, although arithmetic is taught for the sake of industrial efficiency and a discipline which for the most part is specific, from both points of view it must be taught as an academic whole. Various applications have

**The scope  
of academic  
organization  
in general  
education  
limited by  
its relative  
worth.**

been excluded as useful only to the specialist, but its higher processes are dependent upon the lower, and both practical applications of processes and principles, and such moral and intellectual habits as may be generally applied, upon its mastery as an academic branch. Hence, it must



be taught as an organized academic whole, in spite of the fact that its peculiar organization is useless to varying apperception except through a confusion of the many-sidedness and recurrence of a particular application with the many-sidedness and recurrence of the material to which it is applied. On the other hand, physiology and anatomy, introduced by the Combes and Horace Mann, and sanctioned by Mr. Spencer for the sake of health, are rapidly taking on a purely hygienic form to the exclusion of anatomical and physiological treatment. Here the subject matter is directly useful to those not specialists only from the standpoint of hygiene, and the details necessary to complex academic organization in the old physiological sense are not included. A somewhat similar change in organization would ultimately take place with civil government, useful to the majority only as directly preparatory to citizenship, were it not that so many of its logical groupings are directly useful in their academic interrelationships. That is, civil government, as an organized academic whole itself, becomes a part of the specific system which furthers good citizenship. With it, the application of the test of relative worth for the sake of direct furtherance will merely eliminate technical subdivisions and prevent the absurdity of young children memorizing the United States constitution in all of its parts.

In the case of the natural sciences the contribution to direct furtherance comes in the shape of both isolated facts and general principles. However great the amount of material included by the test of relative usefulness, such complexities as Joseph Payne encountered in his effort scientifically to explain the piledriver make impossible the teaching of complete sciences except to the specialist. But while each specific relationship must become a part of the system of direct preparation which it furthers, as Thomas Hill long ago pointed out, it need not be taught in academic isolation, but in illustration of a principle, whose study even as distinct from others not only ensures in part the organization necessary to academic system, but affords opportunity

for experimentation and the acquisition of the intellectual and moral habits peculiar to laboratory work.

As for the general discipline, so long assumed to be improbable without the mastery of formal academic branches as wholes, an overwhelming sum-total of facts, arguments, and illustrations has shown it to be the crowning result of the systems that directly prepare for life, including as they do the cumulative and certain addition of the conditions essential to general application, in place of being the incidental by-product of some academic subject whose chief aim is a specific discipline, often not general within the academic field itself.

Educational reform does not lie along the line of academic specialization required in common of all with a view to more thorough specific discipline. It permits academic specialization to vary with individuals, and subordinates it to a direct preparation for life which collectively constitutes not merely a body of isolated knowledge, but a system of mutually helpful activities made certain by repetition, and independent and continuing in operation when formal instruction reaches its limit. Contrasted with this, it is a puerile scheme of education which takes general discipline for granted, and leaves direct preparation to academic outlines and individual apperception. The national system of education which is not compelling enough to reorganize and develop the knowledge and experience of a people is doomed to be conditioned and dominated by the popular ideals which it fails to transform.

While each phase of life has its specific morality, general morality must be similarly organized. No "formal lessons" in morals and manners can answer here. Not Dr. Sheldon's moral selections from literature,<sup>90</sup> the virtues resulting from school routine, Mr. Fairchild's illustrated talks on boy life,<sup>91</sup> the emphasis of moral subject matter in academic subjects, or, still less, Mr. White's biographical

**A national system of education must either dominate national life or be dominated by it.**

**Education for every phase of direct preparation, must be truly formal.**

course of study with its honesty in the third grade and industry in the fifth.<sup>92</sup> Moral instruction means all of this and something more. The cardinal virtues must become the interrelated centers for definite systems of knowledge and activity in which each of the formal phases plays its properly proportioned part. So with industrial efficiency, as yet but partially analyzed, social service, and even avocation itself. As for religion, the church should not be a mere lecture room, but a school, and the Sunday-school, parochial school, or synagogue not merely a place for formal worship and purely academic instruction, but a training school for service in which rightly directed activities and essential relationships are made certain through repetition, and become general through their continual re-enforcement by the conditions favorable to application.

From the standpoint of school administration the fundamental deduction from all this is that morality, health, industrial efficiency, social service, citizenship, and avocation must be formally taught. This does not mean merely separate instruction in each phase for a fixed number of recitation periods in the weekly program—lessons in morals and manners, catechetical instruction on the duties of citizenship, or the academic drill on sacred things that Matthew Arnold insisted tended to breed irreverence.<sup>93</sup> Nor does it mean merely a logically organized subject matter, courses, and text-books—histories of industry, civil governments, and elementary sociologies. It means formal instruction that will develop formal self-activity through direct preparation for life, a formal instruction of which formal recitation and formal text-books are but occasional parts. Its organization is broader and more systematic than that of the academic subjects which it in part includes. It constitutes the true correlation which makes the interrelationship of various branches a certain means to the useful co-ordination and subordination of their subject matter and activities with the ideals, the

**"Formal" lessons and text-books only parts of such a formal or pedagogical whole.**

vocabularies, the knowledge, and the habits which collectively and systematically form the training as a whole. Here, formal instruction, in the sense of organization, means reorganization of the course of study in its entirety for the cumulative development of a system in which co-ordination and subordination are based upon the relative worth of its constituent relationships from the standpoint of both direct and indirect furtherance of all phases of the educational aim. With the subject-matter of each of the more many-sided academic branches so selected and organized, most recitations will become, in part at least, lessons in morality, industry, and citizenship, as well as in geography, history, or literature. For complete correlation and review for at least part of the training essential to some of the phases, separate recitations must be provided, and separate text-books and recitation periods may become necessary. The supreme need, however, is experimentation and research in universities and schools of education, with a view to providing the material directly and indirectly most useful not only in the training of citizens in general, but in that of teachers, text-book writers, and makers of courses of study.

In the case of morality and religion, as already pointed out, the problem is one of selection, organization, and method rather than of analysis into definite ends. That is, the problem is pedagogical rather than moral or religious. Faith, hope, charity, reverence, obedience, meekness, moral traits, and Christian virtues must be taught as thoroughly and cumulatively as the Jesuits drilled upon the classics and submission to authority. The school cannot become a church, but the church must become a school. In place of teaching all biblical passages as if they were of equal worth, and leaving correlation to concordance and marginal notes; in place of annual repetitions of formal readings in prayer-book and psalter, too isolated and mechanical to be cumulatively impressive; in place of vary-

**Moral and religious education must become more truly formal.**

ing and irregular attendance upon sermons whose topics and sequence are determined by individual judgment; if not in place of, at least in addition to, catechetical instruction in church dogma which men and women are permitted to forget, for children who do not understand, there should be substituted a cumulative and efficient course of study in moral and religious life in which not only all the relatively most useful ideals and habits are made sure, but are so continually re-enforced by interrelated knowledge and activities that ideals tend to become consistently dominant and habits to be invariable applied. For example, if meekness and "seeking not her own" are really essential Christian virtues, they should not be left to an occasional scriptural reading or eloquent ministerial appeal. Each necessary trait must be cumulatively developed from the standpoint of feeling, vocabulary, knowledge, many-sidedness of relationship, habit, and the conditions favorable to general discipline, until it becomes a part of individual life and character. With the masses less interested in theological disputation than has been the case since Chrysostom first plead for simple faith, and increasingly willing to serve their fellows through the many-sided points of contact with life afforded by the institutional church, sufficient time must be spared from systematic theology and higher criticism for priests and ministers of God to learn how to teach. To mere homiletics must be added the system of knowledge, ideals, and habits essential to right living, more complex than theology itself. If it is to be taught effectively to the masses still willing to come to school, the separate instruction provided by a hundred creeds and tremendous resources in almost every community available for it must be adequately utilized. The failure so to utilize them constitutes the greatest waste in present-day education.

The teaching of morality in school is steadily becoming more formal. Text-book instruction in temperance hygiene and lessons in the humane treatment of animals are required by law in most schools of the United States. In

France and Argentina moral instruction through text-book and formal recitation is an essential part of the system of public instruction. Nowhere, however, has moral instruction

**The teaching of morality in school not yet formal in the pedagogic sense.** taken on the broadly systematic form necessary to the cumulative organization of all moral knowledge and experience that can be furnished or directed through the school. The "ethical culture" schools have made the whole atmosphere of the school moral, as the parochial school has made it religious, but no scheme of organization as yet persistently repeats all fundamental moral ideas and activities in the relationships most useful to both the direct and indirect furtherance of morality, until not only habits of morality are firmly fixed, but the conditions favorable to their general application are cumulatively and certainly associated with them. What the parochial school is doing for dogma and formal religious observance must be done even more persistently and systematically through the organized co-operation of home, church, and school, for all that is specifically essential to right living.

Perhaps the most hopeful field for the early development of the cumulative system essential to direct furtherance is that relating to health. Here, for physiology and anatomy is rapidly being substituted an organization which is definitely hygienic, supplemented by the numerous hygienic activities which medical inspection, school nurses, bureaus of health, medical and other hygienic associations are developing in or about the school.

**In hygiene, efforts to organize and dominate every-day life ensure pedagogic system.** Complete correlation and subordination has not yet taken place, the relative worth of related knowledge and activities has not yet been determined, but gradually there will be added to the formal lessons in hygiene in their formal place in the week's program a specifically related mass of knowledge and experience drawn from history, geography, literature, sociology, current events, and the every-day life of pupils, community, and school that in its sum total will

be strong enough not only to influence self-activity, but to become a permanent and dominating part of it.

Industrial efficiency, social service, citizenship, and avocation are not so far along. They have not yet been even logically analyzed into definite ends. Still less has the relative value of relationships directly furthering them, and essential in each to the five forms of educational self-activity, been determined. But their complexity has been revealed through the very conflict now existing between various means to their realization, and system will unify conflicting parts as the test for relative worth correlates and subordinates them.

To sum up, specific discipline, in the sense of system, can be differentiated into three distinct forms of organization: system which directly furthers the specific phases of the educational aim; system which indirectly furthers them through developing formal self-activity; and academic system which furthers each. Of these, the system which certainly furthers direct preparation includes and makes certain the other two. It needs not only certain habits which are directly useful, but the specific relationships most favorable to mere remembrance, varying apperception, and general discipline in the field of each specific aim. From the standpoint of general preparation, it needs for all learners the knowledge and the relationships that constitute the directly useful portions of all academic subjects; and from that of specialization it needs for most individuals, adequate knowledge of one or more branches as systematic wholes. Cumulative impression, mere remembrance, varying apperception, and general discipline, in turn, demand as many-sided and certain a knowledge as possible of all academic subjects in their general relationships, regardless of their direct usefulness. This indirectly useful system, specifically related to direct preparation through the conditions favorable to useful application in the various fields, constitutes with it, and the academic branches essential to each, a complete scheme of education whose most useful parts have

**The test compels pedagogical system for direct and indirect furtherance and academic system.**

been determined by the test of relative worth, and made certain not only through instruction, but through their many-sidedness, recurrence, and emotional appeal in life itself.

#### *4. Application of the Test to Academic Organization*

Whether applied with a view to direct preparation or to formal self-activity, the test of relative worth organizes ideas and activities into at least partial academic system. Where common school branches possess academic organization it is usually essential to their direct usefulness. Those principles and mechanical operations of arithmetic that survive the tests of elimination and relative worth are interdependent and must be arithmetically organized. Geographical and historical sequence and location, together with the topical development of their directly useful subject matter, are essential, both from the standpoint of direct furtherance and from that of remembrance, apperception, and application. Even hygiene follows such general anatomical and physiological system as is apparent from the learner's experience with his own body.

On the other hand, where, as in the case of reading, writing, spelling, and language work, the direct usefulness of relationships is not dependent upon academic grouping and order, but is purely pedagogical, readiness of remembrance and apperception demands logical organization of the relationships which the test of relative worth assigns to each stage of instruction. That is, while the words to be recognized, spelled, or written, and combinations of words in oral speech or written composition, may be selected without regard to their logical relationships, their logical grouping, at least in the sense of their association by essential similarities, is in itself pedagogical. Words from the same Latin or Greek root may be introduced at different points in the school course, but their etymological grouping, limited to those that are similar in spelling and

The test organizes ideas and activities into at least partial academic system.

Where direct or indirect furtherance does not demand logical organization, pedagogical method does.



in meaning, constitutes a highly effective factor in spelling method. Similarly, correct forms of speech having a common grammatical explanation are more readily mastered, if they are simultaneously or cumulatively taught together. Where the partial identity on which a particular logical grouping is based is comprehended by the learner and consciously kept before him, it becomes a memory or apperception center.

It should be clearly perceived, however, that from the standpoint of general education application of the test of relative worth not only ensures academic system, but limits it. It is included only in so far as it is many-sided and frequently recurring, either in direct usefulness or in furthering some phase of formal self-activity, and not as a means to the comprehension of a branch of knowledge as a whole. For example, Joseph Payne was logical and scientific in attempting to teach children, through individual experimentation with the pile-driver, the inter-relationship of weight, gravitation, density, porosity, and so on, but violated the principles of relative worth, both from the standpoint of direct usefulness and of remembrance and apperception.<sup>94</sup> Neither the technique of the pile-driver, nor the particular combination of physical facts and principles necessary to explain its operation is many-sided or frequently recurring. A large part of the whole system of physics was involved in an introductory lesson, which, at best, represented a single application of a group of principles which must be separately mastered in the science itself, as in direct preparation, before they can be brought into relationship to each other. Application of the test of relative worth to the subject matter of the natural sciences results in a far more gradual and partial development of academic system. Thomas Hill's selection of the principle of oxidation is the sort of a first step toward scientific system that direct preparation justifies.<sup>95</sup> Oxidation is many-sided, and frequently recurring in its relationship to combustion, candle, gas light,

**Determina-  
tion of rela-  
tive worth  
ensures  
and limits  
academic  
organiza-  
tion.**

and oil lamp; to rusting tin cup and tarnished door knob or silver; to the purification of the blood through respiration. As a detail of direct preparation it is complete in itself. The next scientific fact or principle selected may be from physics or biology, and have no immediate academic relation to it.

Yet, in the absence of academic system other than that involved in the teaching of useful principles as yet unrelated, laboratory training can be effectively given and the specific discipline peculiar to scientific method developed. If in this fashion density has been added to gravity, and porosity to density, as of sufficient many-sidedness and recurrence to figure in direct furtherance, they can finally be inter-related through experimentation with the pile-driver as one among many interesting applications, or more permanently combined in essential academic organization in so far as each general relationship involved is itself many-sided and recurring.

The sum total of academic organization resulting from direct preparation, however, is limited and partial. Directly useful facts cannot be taught in isolation from each other and yet be directly useful, but should at the outset be associated through their common relations to the phase of the aim on account of whose furtherance they are selected. Each should be taught in academic relationships as soon as they become possible through the accumulation of directly useful material from the same academic subject, but, only in so far as academic relationships are either themselves directly useful or are indirectly useful through remembrance, apperception, and application. In arithmetic this academic organization begins at the very start. The interrelationship of the various mechanical operations is not only directly useful, but essential. In language work it develops far more gradually, keeping pace with the cumulative development of the habits necessary to correct, varied or expressive speech. Except in so far as formal grammar contributes to this end,

So limited,  
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it has no place among the required school subjects. The habit of logical analysis which justifies parsing even in the eyes of Matthew Arnold can be developed more usefully, retained more permanently, and applied more generally, if formed as one of the conditions favorable to the carrying over of directly useful relationships through the general discipline essential to each phase of direct preparation. On the other hand, it is precisely these conditions that ensure formal organization to history and geography. Even if their directly useful subject matter were not so inclusive as to admit of topical classification which directly contributes to industry, citizenship, and other specific aims, it, in any event, furnishes highly useful remembrance or apperception centers, while general geographical and historical sequences and locations peculiarly further remembrance, apperception, and, therefore, application.

This is also true of literature and art. Partial academic organization based upon the relative worth of component relationships, both to direct furtherance and formal self-activity, is essential enough to be firmly memorized and retained by all learners at each stage of instruction.

**The test will ensure different selection and organization within the elementary branches.**

In the elementary course of study the effect will probably be confined to the selection of directly useful material within the present common school branches, the modification of academic organization from the standpoint of the relative educational worth of relationships, and the reorganization and correlation of all subject matter and experience from the standpoint of direct furtherance, so far as it can be controlled by the school.

In the high school and the college each subject required of all students must be similarly tested and reorganized, with the further probability of the addition to the required subjects of parts of other branches extensively enough drawn upon for the sake of direct furtherance to make academic organization aid both it and formal self-activity. Sociology,

**In higher branches, essential parts now elective will be required.**

ethics, economics, political economy, civics, psychology, chemistry, physics, and biology, in so far as they are not already required branches, will in part become so. The point in the course of study at which each should be studied as a separate subject depends upon the amount of its subject matter found immediately and directly useful, and the relative direct and indirect usefulness of its organization as compared with that of other subjects. Where time available for memorizing is not adequate for both direct preparation and separate instruction in all useful subject matter that has reached the stage of accumulation in which more complete academic organization is possible and useful, relative usefulness of organization also determines which branches shall be separately studied and which postponed. In any event, relationships selected from each will figure at every stage of advancement in cumulative organization, both directly useful and academic.

When, as America was first beginning to feel the Pestalozzian influence, Thomas Hill sought to reconcile psychological and logical order in his "True Order of Studies," he believed that the necessary logical sequence, in which the various branches follow each other as completed wholes, corresponds with the natural order of the periods in which the powers of the soul attain their maturity. It follows that since "the powers of the soul are developed somewhat simultaneously," the various divisions of human knowledge should "in every stage of common or liberal education keep proportionately pace with each; that the parent or teacher should watch the development of the child's mind and character, giving it the higher truth as soon as it is prepared for it; but remembering that one necessary part of the preparation is the study of lower truths."<sup>96</sup> This "circle of human sciences," "bound together in an ascending *spire*"—the obvious inspiration for the "spiral" or "concentric" order of instruction—vainly emphasizes the truth that partial academic organization and

The "spiral method," unlike cumulative system, is based upon mere ability to comprehend.

interrelation is possible at each stage of instruction. Had its argument been comprehended and heeded, there would have been no disorganization of the various branches in their elementary stages, no number work, language lessons and nature study, which, in the effort at simplicity, presented ideas and activities in isolation from those on which depended not only their permanent usefulness, but their readiest mastery. Its fault lies in the assumption that each logical relationship should be developed just as soon as it can be understood. There are many relationships capable of immediate comprehension which lack immediate usefulness. Application of the test of relative worth, including at each stage of development *immediateness* of many-sidedness, recurrence, or emotional appeal, not only prevents the two extremes—academic organization that children cannot put to use and isolated knowledge and activities relatively useless through lack of organization, but the misapplication of the spiral method which develops useless relationships at each stage of advancement merely because they can be understood.

It also lays bare the relative inefficiency of the “incidental instruction” of some primary schools which, at its best in the hands of a great teacher, means systematic organization of material in direct relation to life without the aid of academic grouping. In the hands of the mass of culture-epochists, including too often the Herbartians, it has meant temporary and artificial organization based upon some story of primitive life and nascent racial interest. At its worst it has meant the teaching of facts which are “simple” through their isolation from all system and organization other than immediate childish experience. If it was not for the fact that life itself outside the school inexorably superimposes its relationships, classifications, and systems, the product of such “simple” instruction would be hopelessly simple children.

“Incidental instruction” and artificial correlation unnecessary.

In this application of the test of relative worth to the rela-

tionships which collectively form academic organization discipline is not forgotten.

The cumulative organization directly useful and indirectly useful, of both experience and academic knowledge, is the true means to the continuity essential to discipline, both specific and general. Each formal branch develops so slowly that its useful habits and relationships are singly formed and persistently used at each successive stage of complexity before the next is reached. The relative certainty that an even less determined and systematic treatment has long given to the mechanical operations of arithmetic will be shared and exceeded by what is essentially useful in every branch. Through the partial organization of each, any intellectual or moral habit that it peculiarly furthers, generally useful in high degree, will be more certainly developed than when the whole multitude of relationships involved in the mastery of the branch as a whole are developed with it. There is nothing in the habits of observation, discrimination and interpretation, accuracy, perseverance and open-mindedness resulting from laboratory practice that cannot be effectively gained by experimentation illustrative of principles selected from various natural sciences, through applications that will continue to be useful in the every-day life of individuals who will not become scientific specialists. There is no mathematical habit that cannot be more effectively taught through the more persistent study of the parts of arithmetic, algebra, and geometry, generally and permanently useful to others than mathematicians, than through<sup>71</sup> the concentrated study of each as a whole, soon to be forgotten as a whole by the mass of students. Or, as Mr. Bain pointed out, there is no linguistic habit that cannot be more permanently taught through the cumulative application of such parts of English grammar as are continually essential to a correct and graceful style,<sup>97</sup> than by all the concentrated analysis of inflection and construction that Cicero, Pliny and Quintilian, and Ascham

and Sturm fastened upon the modern grammar school and college.

It must not be forgotten, however, that no matter how limitation of subject matter within an academic branch may tend to ensure specific discipline, general discipline demands close correlation with direct preparation. Habit that is based upon concentrated instruction may be limited to the school, while that based upon persistent usefulness in everyday life is permanent and continuing. Whether the habit is developed in directly useful experience or through academic organization, it is direct preparation, and direct preparation alone, that definitely relates it to the conditions favorable to its general and useful application. The pure science, the purely academic subject as a whole, is concerned only with itself.

**Correlation of academic system with direct preparation essential to general discipline.**

##### 5. *The Reorganization of the Course of Study Into a Dynamic System of Essentially Useful Relationships*

The effect of application of the test upon the course of study academically considered is less revolutionary as regards the branches included than in what they include, and its sharp discrimination between what must be remembered by all in common and what can be left to a variable individual choice. The general academic organization of the arts and science course will probably remain much the same. In the high school and the college the effect will be similar, its most striking phase being a partial reversal of required and elective subjects. All students will be required to master cumulatively the portions of psychology and ethics, literature and art, sociology, economics and political economy, elementary mathematics, and the natural sciences that are essential through high degree of both direct and indirect usefulness. Among these, general history, together with literature and art, must early be organized as separate branches on account of the general historical and

**Less change in branches than in what they include and make certain.**

geographical sequence and location essential as memory and apperception centers. Granted that their fundamental groupings are continually reviewed throughout the college course, the prevalent academic specialization in historical periods and epochs and in periods and phases of literature or art will doubtless continue on account of the almost limitless historical and artistic details of approximately equal value from the standpoint of both service and culture. But the basis of selection will not continue to be merely scientific or æsthetic. In every historical period and in every phase of art, what is relatively most useful in direct furtherance of religion and morality, health, industry, social service, and citizenship will be included. The application of the same relative test to interrelationships as to details will probably prevent the directly useful material thus included from being organized into such separate and specific branches as the history of hygiene or industry, or morality as taught in literature and art. Many details have both directly and indirectly useful relationships which separate presentation of each phase of direct preparation would tend to overlook. But topical organization in furtherance of each specific general aim is essential within every historical period and phase of culture.

Paralleling this organization into academic branches is the far more complicated system of direct preparation, of which these topics within the academic branches are a part. The chief disturbance of the present college and high school program will be the creation of specialties organized for direct usefulness to each general phase of the educational aim, through which all formal subject matter is correlated with current experience, and cumulatively subordinated as part of the direct preparation which has gone before. The relative proportion of the formal program that direct preparation will consume can be determined only through application of the test of relative worth, together with experimentation in actual instruction. It does not stop with the separate academic organization of re-

Academic organization paralleled by a cumulative system of which it is a part.



quired relationships in ethics, hygiene, economics, sociology, politics, and æsthetics, but will put them into their most useful and permanent association with a great system of ideals, facts, interrelationships, habits, and general disciplines which has cumulatively resulted from selection, organization, and instruction on the basis of relative usefulness from the beginning of formal instruction and throughout each successive stage of education. The simplest step that can be taken toward reorganization is the placing of the directly useful subjects just discussed among the required branches, and the application of the test of relative worth to them as to history, literature, and art in the selection and organization of their subject matter and the determination of the order in which they shall come in the course of study.

As to mathematics and the natural sciences, if the test of relative worth is rigidly applied, the first year of the high school is likely to present a varied selection of facts and principles in which arithmetic, algebra, geometry, and all branches of natural science are each in part represented. In mathematics this will mean a year of required work, divided between advanced arithmetic, the phases of algebra most directly useful, and possibly two or three books of geometry. In science it will involve general or elementary science in the form of laboratory work in which the most directly and immediately useful facts and principles of all sciences are experimentally illustrated. Beyond the first high school year mathematics will be confined to specialization except for the time spent in review, while the application of the test of relative worth will determine the order in which the various natural sciences shall be taught. There will probably be enough directly useful material in each for it, when added to the general relationships useful as memory and apperception centers, to justify the requirement of each as a specific branch, though not in the exhaustive detail now characteristic of physics, chemistry, or biology.

**Higher mathematics left to the specialist, but not the general organization of each natural science.**

After college entrance, the different environment and methods of instruction and the possible development of new individual capacities or interests justify one last effort to redetermine or verify the line of specialization which each individual has been following. The required subjects as redetermined by the test ensure contact at this stage of development with all general branches of knowledge with the exception of language, mathematics, and the laboratory phases of science. Mainly to test again mathematical ability, and only secondarily for the sake of a peculiar discipline, a term should be taken in either algebra or geometry. From the same standpoint, a term of laboratory work in some science should also be required, as opposed to laboratory work in all for a partial and useless rediscovery of facts and principles. Adequate preparation for both will have been ensured through the persistent review throughout the high school course of the parts of mathematics and natural science essential through their high degree of general usefulness. While as already demonstrated, there is no ground on which language can be required other than direct usefulness or broader apperception in some special field, on this latter ground at least, mastery of one foreign language should with rare exceptions be exacted of all, if not through specialization previous to college entrance, at least to keep the way open at the close of the college course for unexpected phases of specialization that require foreign languages. Only students who show marked incapacity for foreign languages or certain to specialize in fields which do not require them, should be permitted to ignore them altogether.

Finally, in order that the learner shall be continuously conscious of the relative usefulness of what he is being taught and correct in the judgments necessary to general discipline, he must cumulatively master parts of pedagogy and logic. They will probably be gradually developed, however, as

**Attempt at  
specializa-  
tion in each  
academic  
field should  
be made  
after college  
entrance.**

phases of direct preparation, rather than presented as separate branches.

This forecast of the reorganized course of study is at best wholly theoretical and tentative. Valid determination and organization can come only through the actual application of the test of relative worth, from the standpoint of both direct and indirect furtherance of the educational aim. Probably no academic subject is generally useful in all of its parts. Mastery of the utmost detail, academic completeness, pure science, should not be required of all in a common field in the general school and college course. It belongs to specialization, and even there, rarely to vocational specialization except in the high sense of the advancement of science.

#### *6. Application of the Test to Specialization*

Distinction must be made between at least three kinds of specialization—first, exhaustive mastery; second, mastery of all that is essential to a specific vocation, whether liberal or industrial; and third, mastery of an elective subject in furtherance of subjective adaptation that either takes the form of avocation or leads to vocation or exhaustive mastery. In each form of specialization the application of the test of relative usefulness determines the order of worth of both the relationships directly useful to the specialty, and those favorable to general discipline and other formal activity within its specific field of operation. In each the branch as a whole may or may not be included. In exhaustive mastery alone is every detail of the branch as a whole or some part of it thoroughly mastered. Since at times both vocational and subjective specialization are exhaustive, it is easy to understand why the popular conception of specialization is exhaustive knowledge.

**Three distinct kinds of specialization variously affected by the test.**

In each phase of specialization, the test of relative immediate worth distinguishes between what is to be made definite

and certain, and what can be left to varying apperception. With the exception of exhaustive mastery, including the study of the exact sciences, it also determines the selection of the whole content. In the case of vocation or exhaustive mastery, involving the correlation of various branches, it further determines the order in which the essential subjects shall be mastered. Finally, with the exception of the exact sciences, it indicates the relationships that shall first be made certain, and, as in direct preparation in general, develops essential system. Even in the case of an exact science, it reveals the conditions favorable to general discipline within the science itself.

These results of the test can be readily illustrated in each form of specialization. At first thought, determination of the relative usefulness of material to be exhaustively mastered or included in an exact science appears to be without practical application—all is to be included and studied. But all the material of specialization cannot be certainly memorized and permanently retained. The solution of particular theorems of geometry will be in part forgotten even by the mathematical specialist, to say nothing of the student who elects to study them. The essential thing is that both shall know where to apply them and where to find them. The successive steps in the solution of a particular proposition are confined to it alone, and its applications may be shown by the test to be few and rare. But the successive steps essential to the original solution of any proposition must be ground into the memory. For example, take not only the habit of successively combining the newly derived fact of an original demonstration with all given facts until the stimulus to mathematical judgment is identified, but the groups of possible associations that each frequently recurring fact possesses. As already pointed out, the fact of equality of angles must be so mechanically associated with opposite vertical angles, alternate-interior and exterior-interior angles, right angles, angles whose sides

The test distinguishes between the essential and optional material of specialization.

are parallel, superimposed angles, angles equal to a common angle, opposite angles at the base of an isosceles triangle, angles of an equilateral triangle, and corresponding angles of equal triangles, that they automatically suggest themselves in succession, or short-circuit the identification through the suggestion of some stimulus in the geometrical figure itself. Or, to take an example from physics, it is far more essential to have reduction in the volume of a gas certainly associated with pressure, reduced temperature, mixture of gases, and all other possible explanations, than to readily recall the mass of details which may be logically associated with each. Similarly, in the mastery of a language, the personal and tense endings of verbs, the signs for the case and declension of nouns should be mastered by the incessant and persistent drill that is often centered on a specific declension or conjugation which has not an infinitesimal fraction of their many-sidedness and recurrence.

Within the field of vocational specialization the need for the test is just as great. The National Confederation of State Medical Examining and Licensing Boards, at its meeting at St. Louis in 1910, favorably discussed the proposition to discriminate between the parts of *materia medica* essential to the general practitioner and the balance of its sum total which neither practitioner nor student can long retain.<sup>98</sup> The common practice of approving or rejecting the work of students in academic or professional examinations on questions involving the pettiest details that petty minds happen to unearth or remember is neither pedagogic nor scientific. The very necessity for thoroughness in specialty or profession makes discrimination essential. Such dog-and-the-shadow thoroughness, which loses the useful in vain snatches at the unattainable, must be sharply contrasted with the habit of exhaustive study or observation vitally necessary in selected instances of application. Here, as in direct furtherance in general, the test is not only necessary to determine the habit to be formed, but the instances to which it is to be applied.

Indeed, the very habit of exhaustive observation furnishes excellent illustration of the test's determining not only relative worth from the standpoint of discriminating between essential and optional material, but the order in which essential material shall be mastered. Since no habit is more highly useful in natural science, more many-sided in its application, and frequent in its useful recurrence, it should be developed at the very start. This is why Agassiz kept returning the student of natural history again and again and again to the study of the same old fish when he first entered upon his course of training in the pioneer summer school down by the sea. Within the field of specialization, then, as in that of general furtherance, application of the test must determine the relationships so directly useful that they must be transformed into fixed groups and habits, the order in which they should be mastered, and, as a result, the specific system within the specialty whose certain and permanent mastery is essential to its direct usefulness and the general discipline which direct usefulness demands. Not only is this true of the material within a special branch, but of the order, correlation, and subordination of branches in the specialized field. Immediateness of many-sidedness and recurrence is what led the late Dean Spangler to regret the temporary necessity which made engineering students make up deficiencies in mathematics through summer study divorced from those phases of work in which it is applied. Efficiency not only demands that the various divisions of a specialty shall be taught in the order of their immediate usefulness, but that all essential interrelationships shall be similarly ordered.

#### *7. Specialization in Portions of Mathematics a Necessary Preparation for Many Vocations*

Whether for the sake of exhaustive mastery or vocational specialization, no subjects are more generally essential than

mathematics and the modern languages. The laws of every science are reducible to mathematical form and all scientific research must be mathematically interpreted. Applied mathematics dominates every phase of engineering and figures prominently in various other vocations. A large proportion of students will, therefore, engage in the specialized study of various selections from its advanced phases, while a few will study it exhaustively, either from the standpoint of the rare vocations requiring completeness of mathematical knowledge, or to ensure the advancement of mathematical science. It has not as yet been fully enough realized that although mathematics is an exact science, its various branches are so little interdependent that the introductory parts of one can in most instances be thoroughly mastered with little regard to others. Of course, where the application of the test of relative worth demands the mastery of some advanced portion of a particular branch, more general specialization becomes necessary. It is not impossible, however, that the result of the test for specialization in certain vocations, as for direct preparation in general, may be a marked reduction in the amount of mathematics covered, which would ensure concentration quite as effectively as increasing the time devoted to mathematics in the school program.

It may be limited, however, to parts of the various mathematical branches.

That is, with the limitation of advanced mathematical study to the specialist, and the consequent reduction of the recitation time wasted in exposing and correcting individual deficiency, the still further advantage of less material to master should ensure the time for the persistent review indispensable to certainty and permanence of mastery.

At least two classes of individuals, not now certainly included among serious students of mathematics, should participate in this specialization—all advanced students who are at all likely to engage in scientific research, and all children in the elementary school who show marked arithmetical ability. The former should be compelled to exhibit

facility in statistical method before being admitted to candidacy for the doctor's or master's degree through any course involving statistical research; the latter should be given opportunity for specialization through admission to high school classes in mathematics, the organization of special classes centrally located, or individual instruction that will as effectively meet such cases as it has been here and there planned to meet exceptional deficiency. Whatever the stage of instruction, however, at which mathematical specialization begins, it should be given by an instructor who will not only clearly explain the successive steps in the demonstration of particular theorems and ensure the persistent repetition necessary to mathematical habit, but possess pedagogical training adequate to general discipline within the field of the special mathematical branch.

8. *Specialization in Some Modern Language Broadens Apperception, Is Helpful in the Majority of Vocations, and Desirable from the Standpoint of Avocation.*

While mastery of a foreign language is not essential to apperception in general, it tends to broaden it in specific fields. If, however, it is allowed to take the place of direct preparation, and absorbs an undue proportion of time in grammatical subtleties and mechanical mastery, language study may actually serve as a check upon more general apperception through the vernacular. For this its abstract discipline offers no compensation. There is nothing in it peculiar enough to justify specialization, useful enough to keep a man from exemplifying the popular saying that one can be a fool in a dozen different languages, or many-sided enough though derived from the dozen, to make him versatile, even in the sense of being all kinds of a fool. That some language—almost invariably a modern one—is directly useful in the majority of vocations, and that most languages, especially the classical, are desirable from the standpoint of avocation, is no reason why college entrance requirements



should insist upon a mechanical mastery of two languages during a four year high-school course at the expense of both more general apperception through the vernacular and more generally useful phases of direct preparation. Moreover, if a language is to broaden apperception at all, it should be studied so thoroughly that it can be read with both ease and pleasure, and, so far as many vocations are concerned and some phases of avocation, if it is to be directly useful at all, it must be unhesitatingly and correctly spoken and readily written. To ensure so complete a mastery, more than half the time is probably necessary for the teaching of one language than is usually devoted in the high school to that of two. Yet at least two languages are necessary in certain fields of specialization. To require no language for college entrance is simple justice to the occasional student who has no taste for a foreign language or no need for it in his vocation. To accept no more than one seems the only safeguard in the high school for direct preparation and other phases of specialization than language study.

Two alternatives remain—to begin the study of one or more languages after college entrance, or to master one or more below the high school. From the standpoint of vocational specialization, the first alternative is permissible, and, where specialization comes late, at times inevitable. Against it is the wastefulness of mechanical work in a period of development where the ready use of foreign languages opens the way to a broader scientific and æsthetic horizon. In favor of the second alternative is the old physiological argument of readier vocal adjustment to foreign language in childhood combined with the greater interest of children in the mechanical, the longer period available for the repetition of essentials and the formation of habits, and the immediate usefulness of foreign language, not only long before college is reached, but in the experience of those for whom college training is impossible. Two or three lessons a week throughout six or eight years of element-

Practica-  
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ary school life, given at special centers, as in the case of manual training, or in a series of schools by special teachers, as in the case of music, should ensure the conquest of any language. This would not be required of any or permitted to those who needed the time for required work, but that an overwhelming majority of elementary school pupils have the taste and ability and can afford the time to specialize in language is plainly indicated by the results of private tutoring and of work in private schools.

Where there is no local or individual reason for some other language, the relatively greater usefulness of German and French in a majority of vocations and in scientific research with their broader literatures, cosmopolitan use, and the close contact with America of the peoples who speak them, make their election most probable, especially in small communities where it may be economically possible to have instruction in only one language for an hour or so daily by a tutor whose main support results from other occupation. Wherever possible, however, individual and group interests should be satisfied. The child attracted to Italian through the terminology of musical technique, the pupils interested in Latin through their study of etymology should have immediate and continued opportunity for specialization. Above all, the amplest opportunity should be given the second generation of American immigrants to transform their contemptuous indifference to the rich spiritual inheritance handed down to them through the broken speech of their parents and grandparents, into loving familiarity with the folklore, the literature, and song of their mother tongue.

9. *Even Specialization in Avocation Determined by the Test of Relative Worth*

Aside from the culture and experience essential to social life and common, at least in its many-sidedness, to all classes

of democratic society, avocation is not determinable by the test of relative worth. The employment of the leisure of individuals should be as variable as human nature and the environment in and through which it finds expression. But while innate tendencies on the one hand, and on the other individual interests acquired through varying experience are the active selective agents, it does not follow that formal education is to play no part. If left to itself, individuality may leave its task undone or incomplete. The mass of individuals have no employment for solitary leisure, or lack the variety of employments that can be adapted to varying opportunity and varying moods. Their individuality either confines itself to the selection of a form of social enjoyment which they must find others to share, or is dependent upon one or two forms of active expression of which they tire or for which opportunity is often lacking. It therefore becomes the part of education to make sure that innate capacity and acquired interests determine forms of association at least varied enough to adapt themselves to periods of both activity and repose, and to be in part independent of changing season and locality. In the great cities public amusements provided by professional performers are so frequent and so varied that the temptation is to express individuality in merely choosing the particular way in which one will be a looker on. In solitude, in a simpler environment or out of funds, the looker on, deprived of his usual panorama, will suffer in idleness or find some form of mischief for idle hands to do.

To train each individual to an adequate variety of avocations suited to every state of mind and adapted to the commoner localities and to every sort of season and weather, is merely to extend to the whole of education the Fröebelian principle of counterbalancing possible evil by the development of corresponding good. One should not only be taught to enjoy good reading, to discuss

**Avocation must vary with opportunity and mood.**

**Individual interest determines the field for specialization in avocation.**

and to reflect, but, if not to play well some musical instrument, to paint artistically, to carve skilfully, or to tinker usefully, at least to whittle or to scribble or to play solitaire. From a great variety of restful things, individuality must select some that will seem good when one is tired and alone. This is the moral side of fancy work and smoking. The first step toward checking the one or eliminating the other must be a greater variety of restful occupations. Gardening, observation of the birds and animals of the woods, collections from plants and shells to fossils and Indian arrow heads, scientific experimentation, photography, translation, wood-chopping, fishing—it does not matter what, if avocation is sufficiently varied to meet at all times and in all places the need for solitary enjoyment.

Even here the test of relative worth selects in each avocation the essential relationships whose mastery will be most useful, and where natural tendency or acquired interest fails to suggest the avocations which will be most absorbing, determines those to be pursued for their many-sidedness, frequency of recurrence, and emotional appeal. In England the movement for introducing "fad" work into the school is directly designed to further avocation. In America as yet avocation has mainly been used to draw pupils together into congenial groups with a view to socializing the school.

Within the field many-sidedness and recurrence also are determining.

#### 10. *Only the Test for Relative Worth Can Determine the Relative Part to Be Played by General Education and Specialization*

Only the general application of the test of relative worth and the scientific determination of the factors most effective in pedagogical method will determine the relative part that will be played by general education and specialization in the various stages of educational development. One thing only is sure, specialization will not only play an increasingly

important part, but must parallel general education in each, that is, it must receive from the beginning some share of the time that can be economically devoted to memorizing, except in the case of individuals who must use all their memorizing to make certain the essentials of direct preparation in general. With them specialization will confine itself to the varying apperception of the optional material which, since it cannot be memorized in definite relationships, potently contributes to the individuality of all.

## CHAPTER X

THE CONTINUITY NECESSARY TO A CUMULATIVE AND DOMINATING SYSTEM TO BE ENSURED PRIMARILY THROUGH DIRECT PREPARATION AND, SECONDARILY, THROUGH SPECIALIZATION

THE present reaction from the extreme of the elective system and the new education is largely due to a growing realization that the most indispensable condition to discipline is continuity. Habit in the sense of discipline must be permanent, and in the sense of general discipline must be dominant. To both permanence and dominance continuity is essential. The consequent assumption, however, that the only means to it is academic or vocational specialization will bear some analysis.

### 1. *From the Standpoint of Continuity Habit Must Be Considered in at Least Four Degrees of Complexity*

From the standpoint of continuity, habit must be considered in at least four degrees of complexity: First, the simplest form of specific discipline is the simple habit, distinct from any system, such as the habit of putting on overshoes in rainy weather, the habit of completing a particular sort of task when once it has been begun, the habit which associates two and two with four. Here unbroken sequences and continuity are the essential conditions. That is, not only must the consequences follow every time the stimulus is identified, but the stimulus must continually recur in individual experience. In the case of the most useful habits, whether their usefulness springs from many-sidedness or recurrence in a single rela-

For a useful, simple habit, continuity is assured through experience or cumulative impression.

tionship, continuity is assured by experience itself. The function of education is merely to ensure their initial mastery. Continuity must be assured not so much for habit as for the cumulative impression which emotionalizes its stimulus. Where usefulness of a simple habit springs from high degree of sensational or emotional appeal and the continuity due to many-sidedness and recurrence is lacking, cumulative impression is the sole condition to general application. With many-sidedness and recurrence present, cumulative impression is essential to specific discipline in the sense of simple habit only when it must overcome a habit with which it conflicts. Here continuity must be re-enforced by the cumulative force of feelings and ideals, which on the emotional side we call conscience and on the motor or positive side, will.

Second, in relative simplicity of habit considered from the standpoint of continuity are the particular sequences or complexes of habits which constitute specific discipline in the sense of system. Here continuity of instruction is an indispensable condition to the gradation without which even initial mastery is impossible. A habit which is a condition to further system must become automatic before any attempt is made to master the next sequence of which it is a component part. It is not impossible that the operation of this law explains such periods of arrested development as Swift describes in his "Mind in the Making."<sup>99</sup> Whether the complex process is a motor one or purely mental, further advancement becomes again and again impossible until all sequences and habits which have accumulated are reduced to mechanical operation.

For continuity in this sense, either academic or vocational specialization ensures the time, but not necessarily the gradation. Both must be supplemented by pedagogical method. And even where pedagogical method is ensured, the continuity of purely academic specialization is limited to the period of formal instruction allotted to it unless it continues as a form of vocation or avocation.

**Specialization ensures continuity, but only pedagogical method ensures gradation.**

That is, academic specialization furthers the continuity essential to permanency of discipline only when it is a part of direct preparation for life.

While academic specialization finds its limit at the close of the formal school course, vocational specialization finds its at the beginning. Too early vocational specialization may defeat its own end not merely through the shifting interests and abilities of developing individuality, but because of variable economic conditions which may make it impossible for an individual to continue in a specialization already begun. From the standpoint of specialization permanency is more likely to be ensured where it begins with academic specialization that may lead the way to many vocations, supplemented by all generally and directly useful subject matter that the specialty affords. It should, on the one side, find its continuity in vocational specialization, and on the other in academic relationships useful to life in general. It is direct preparation for life, of which vocational preparation is but a part, that selecting each division and subdivision which is to be memorized on account of its many-sidedness and frequency of recurrence in every-day life, ensures a permanency more enduring than that of mere specialization in school.

Third, in the scale of complex habit considered from the standpoint of continuity is the system of habits and fixed conditions favorable to general discipline. The carrying over of a habit from the field in which it is first developed to other fields in which it is useful is the first step toward continuity as the result of dominance as distinct from mere permanence. Here indirect furtherance through mere remembrance and varying apperception, multiplication of vocabulary, and many-sidedness of knowledge—the very opposite of specialization—are as essential as habit and system themselves. Moreover, as already pointed out, general discipline has been too often neglected within the

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specialty itself for a mere extension of the time devoted to a particular branch to ensure it. To be sure, pedagogical training of the specialist may make it certain within the specialty. In direct preparation, however, general discipline is so indispensable that pedagogical training becomes compulsory. There can be not only no permanency and no dominance, but no system in the absence of pedagogically trained teachers and pedagogically determined experience, text-books, and courses of study.

Fourth, and last in the scale of habit considered with a view to continuity, is the complete interrelation and subordination of all relationships sufficiently useful to be memorized, into the great system of direct furtherance determined by their relative usefulness. This is so obviously beyond the field of mere academic specialization, and so completely inclusive of specialization which becomes permanent as either vocation or avocation, that the futility of specialization alone needs no demonstration. Here is the true continuity not only of permanence assured through continually recurring habits and systems, but of dominance through assured cumulative subordination and concentration. Discussion of the proposed reform of discipline in the light of this analysis should lead to more valid conclusions than mere reaction toward the practices for which the exploded theory of "mental faculties" and "formal discipline" is responsible.

## 2. *The Impracticability of Vocational Specialization as a Means to Continuity*

When Dr. Dewey called attention to the absence in children of the "combined motivation" due in the adult to vocation which "prescribes the chief features of the acts to be performed, and secures, somewhat automatically as it were, appropriate and related modes of thinking,"<sup>100</sup> he possibly gives the clue to Dr. Judd which leads him to suggest that in high school and college continuity can be best attained through early and persistent vocational specialization.<sup>101</sup>

If practicable, this solution of the difficulty would be but partial, associating as it does the persistence of discipline with the least social phase of individual development. But it is only occasionally practicable. Vocation is economically rather than subjectively determined. Subjective capacities and tendencies exclude occupations for which the individual is unfit more frequently than they determine the one for which he is pre-eminently qualified. While the absence of strong native retentiveness, incapacity to make fine discrimination in sound or vision, and lack of motor dexterity at once make particular vocations impossible, the presence of each capacity tends to open up the way to a variety of callings. Indeed, most of the moral and intellectual qualifications desirable in any one are necessary to the highest success of all. That is, if a man is not naturally unfitted for success in a particular calling, the capacities and the habits that will make him exceptionally successful in it are with few exceptions identical with those that would have made him equally successful in others. The square peg must not get in a round hole, but there are usually plenty of square ones.

### 3. *More Likelihood of Continuity Through Academic Specialization Strengthened by Varying Vocational Motive*

Academic specialization, which is primarily subjective, and may be partially or temporarily vocational, furnishes a stronger likelihood of continuity. Special ability in mathematics, natural science, the acquisition of foreign languages, composition, or drawing will show itself earlier than fitness for a particular occupation, and has the added advantage of leading to alternative or various occupations, rather than to a single one for which opportunity may not offer or in which all interest may sooner or later be lost. Sole dependence for continuity can be placed on neither academic nor vocational interest. Witness the victim of a free elective system and the Jack of all trades.

At each stage of education a limited amount of academic specialization should be compelled, strengthened by voca-

tional motive wherever possible. Academic specialization should be taken more seriously and determined upon after earnest and intelligent conference between pupils or students, parents, and teachers, in so far as possible in the light of innate tendencies likely to form the basis for acquired interests. If interest does not become stronger or inability is shown, the specialty should be changed, even if the break should come on college entrance. To continue to compel a mistaken specialization for the sake of continuity would not only be unjust to the individual, but would ultimately defeat its own purpose.

In itself, vocational motive in the sense of a love of some one vocation would in the case of most individuals be the least continuing of all. The boy longs one year to become a missionary or a dentist, and the next is training to be a drum-major, a soldier, or an aëronaut. He is quite as capable of being a merchant as a freshman, a journalist as a sophomore, to finally emerge from college in doubt as to whether he should be a lawyer or a mining engineer. But while the particular vocational aim varies, the incentive of vocation is and ought to be one of the most continuing of motives. As such, in all of its shifts and changes, it should be encouraged and so far as possible made to furnish additional interest in an academic continuity which usually must be otherwise determined. Instead of being scoffed at as illiberal during the college course, it should be prayed for. And wherever there is either an exceptionally persistent longing for some particular vocation not forbidden by native incapacity or economic conditions, or the necessity for an early selection of vocation as the result of economic compulsion, there should be adequate provision for vocational training. Therefore, trade schools, continuation schools, vocational high schools, professional schools open to those who are not college graduates, and, above all, ample opportunity for vocational courses within academic high school and college. Here, however, is the limit to vocational specializa-

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tion as a means to continuity, and so limited it cannot fully perform the function of continuity.

A truly pedagogical continuity is but a means to the perfect mastery of simple habits and sequences, which in turn become a part of increasingly complex but equally certain habits and sequences. It is reorganizing, correlative, cumulative, and brings about a concentration more useful and more permanent than that possible within some one branch of human knowledge. Academic continuity can at best ensure adequate knowledge and discipline within the branch itself and from the viewpoint of the branch. Hence, the inadequacy, relative uselessness, and mutual contradictoriness

Academic or vocational specialization no true basis for continuity.

of falsely Herbartian schemes of correlation that would make geography, language, nature study, and even number the basis for reorganization and concentration. Vocation is a truer basis, but only as a means to the comprehension of vocational life in general. Even in this sense it is as partial as in the other it is impracticable. To ensure continuity through vocational specialization alone would, on the one hand, make the college course utilitarian in the narrow and polemic sense, and, on the other, increase the difficulty which the vocational school already, but so unnecessarily, has in interesting its students in anything not directly vocational.

So far as permanent and dominating interests are acquired through instruction, in distinction from or in addition to those due to innate capacities, they are dependent upon continuity

Continuity made certain only through preparation for all phases of life.

in experience or instruction. In the case of the majority of individuals, continuity in experience cannot be counted upon to ensure the permanence and dominance of the impressions, knowledge, ideals, and habits essential to direct and indirect preparation for life. The reorganization and accumulation which continuity makes certain must be brought about with a view to preparation not for one, but for every phase of life. From the standpoint of

specific discipline, and such general discipline as is ensured for it, continuity in some special subject—it matters not what—is necessary, but cannot be compelled where it proves itself to be counter to natural aptitude or economically unnecessary. Even here the subject matter must be related to life, or reorganization and systematic accumulation will be impossible. For any one basis of academically or vocationally specific continuity another can be substituted and often must be substituted.

4. *Continuity Practicable and at the Same Time Most Useful Only Through the Progressive and Cumulative Organization of the Material Most Directly Useful to All*

Continuity for habit in each of its four stages of complexity can be compelled only with subject matter which is essential to the mass of individuals both as individuals and as collectively constituting community and state. Here alone the individual cannot and must not choose. Here education, if necessary, must persist in the face of natural tendency, culture epochs, and varying interests and desires. Here common sequences and common habits are not only essential to direct preparation for life in its necessary phases, but to the most certain and useful general discipline, a democratic culture and vocational specialization itself. Here continuity must persist not through some formal course of instruction, but through life—not for the sake of the specific discipline peculiar to some special branch of learning, but because reorganization, accumulation, concentration, and certainty of specific and general application are necessary to religion, morality, health, industrial efficiency, social service, good citizenship, right social intercourse, and even the individual enjoyment of leisure. Even when the period is reached when vocational specialization becomes the most immediate aim, and some vocational course or institution adds to reorganization and accumulation from the standpoint of common and certain preparation for every phase of life, reorganization and accumulation from the standpoint of the one, the essen-

tial continuity directly and indirectly useful from the standpoint of every phase, must not only persist but dominate, and such time as is necessary to its persistence and domination through useful selection, organization, and method should be determined by science and compelled by the state. Probably no sacrifice of vocational efficiency will be necessary, but if it should, "social efficiency," in the guise of material "achievement," has not yet become the supreme aim of modern life.<sup>101</sup>

Finally, it has already been pointed out that in the case of the majority of individuals discipline and culture to be continuing must be related to life. If this be necessary for the mere retention of some specific discipline or culture, how indispensable it is in the case of discipline and culture which are not only to be retained, but to become a dominating force. With a view to continuity in this broader sense, relationship of subject matter to life is necessary both in order that the subject matter of the specialized subject can be reorganized from the standpoint of what is essential to life, and in order that the every-day material of life shall be reorganized from the standpoint of the specialty.

5. *Early Opportunity for Specialization Should Re-enforce the Continuity Based on Direct Preparation for Life in General with That Based Upon Subjective or Vocational Specialization*

While specialization, until some phase of it takes on vocational form, cannot be safely depended upon for continuity, just as the selected essential content required of all parallels it to the end, so should it parallel the common course of study from the beginning.

If a foreign language, the higher mathematics, or a particular natural science as a whole is not to be required of all at any point in the educational process, opportunity for specialization in one or more of them should be afforded as early as special aptitudes and individual interests can be detected and encouraged.

As scientific selection of most essential content and determination of most effective method fix and lessen the time necessary to mastery of the subject matter required in common of all, ample time will probably remain for the continuous study of some special subject or subjects not so required. At present, individual instruction in the elementary school has for its aim such adaptation of method to the individual as to compel mastery of an arbitrary course varying greatly with locality and the judgment of individual teachers and text-book makers, but not permitted to vary within a particular school with the varying aptitudes of the pupils. The limitation of this phase of individual instruction to the essential content will make possible individuality in the selection of some part of the course of study. Here continuity should be encouraged, but cannot be compelled as interests change and aptitudes lessen or fail. For the mental traits conspicuous in a particular individual are often different in various periods of development, and the mental traits required for a particular branch of study vary, both in the parts composing each stage of advancement and in the successive stages of advancement themselves.

It must not be forgotten, however, that throughout the entire course of education individuality shows itself in the varying relationships in which various individuals apperceive subject matter which is not certainly and permanently memorized in definite and specific relationships. Whatever may be true of instruction, there is continuity in individual experience. More or less complex and permanent groups of ideas and activities accumulate and develop until they determine character and dominate life. They include the experience that results from formal instruction in so far as it is related to life, always modifying and determining it and, in varying degrees and fashion with each individual, being modified and determined by it. Most schemes of education have had sufficient continuity in the narrower sense to include new factors in it. Each branch of study, even though

Continuities  
of individual  
experience  
dominate  
academic  
education.

imperfectly mastered and retained, becomes an apperceiving center. Information is at least generally classified and in part interpreted in an academic way. Some fundamental sequences and habits are incidentally carried over to life. While most is forgotten, at least impression remains and possibly a culture that too often holds itself afar.

In the case of individuals for whom academic specialization brings continuity or for whom vocational specialization is possible through instruction as well as through life, some specific phase of scholarship may become a dominating force. In the few, the love of liberal knowledge may be strong enough to isolate them from life as unproductive pedants, or inspire them to the high vocation of original research for the sake of knowledge. For the majority, however, the continuities of life make the educational system that least recognizes individuality, individual through the very absence of common and counterbalancing continuities of its own.

6. *The Specific Discipline Involved in Direct Preparation for Life Necessary Not Only to Make Education Certainly Useful, but to Increase the Probability of Usefulness of Every Form of Indirect Instruction*

The truly formal and educational system which the science of pedagogy alone can determine and make universal must dominate the continuities of incidental experience. Its aim is not independent and continuing self-activity, but independent and continuing self-activity that is useful. Instruction furthers it both directly and indirectly—indirectly through impression, remembrance, apperception, and general discipline, whose relationships vary with individuals and may or may not further the aim, and directly through a specific discipline which makes definite and certain the relationships potentially most useful, including the specific impression, remembrance, and apperception which tend to make the usefulness of direct instruction most probable. If impressions are to accumulate so as to most potentially re-enforce useful ideas and habits, they must have fixed emotional centers.



If partial remembrances are to form the basis for useful apperception, the relationships which constitute them must be predetermined. If habits are to have the greatest likelihood of application wherein they may be useful, the relationships necessary to the identification of these stimuli must be mechanically associated with them. If all ideas and activities held in mind by incidental and individual apperception and retention are to be made the means to a many-sidedness which furthers direct preparation for life, adds to a democratic culture, and constitutes the chief condition to useful general discipline, they must be associated with the basal contiguities which make useful inference and identification most probable.

All the relationships just named are as essential to general culture and discipline as to the direct preparation for life of which they form a part. To them must be added the relationships which specifically further in the most many-sided way and with most frequent recurrence each essential phase of life in general, and of the branches or vocations which constitute specialization. Those most essential to life in general are of primary importance, and with those essential both to direct and indirect instruction must be ensured, if necessary, at the sacrifice of those essential to specialized vocation or avocation. For even if "social efficiency" is adequately served, as occasionally it is, by a vocational skill or a fulness of avocation which involves exceptional service to the community at the expense of citizenship, altruism, health, or even morality, the individual suffers irreparable wrong, and society, after all but an aggregate of individuals, loses in the many fields of service what it gains in the one. If in the present state of civilization life must still be sacrificed to citizenship and material prosperity, health to industry, and citizenship to trade or social intercourse, it need not and must not be so in school.

Fortunately, the fewness of the relationships thus essentially useful to all will, in the case of the majority of individuals, leave ample time for the memorizing and retention of those

essentially useful to academic or vocational specialization. The time necessary to memorizing this common content, however, greatly varies with native acquisitiveness and retentiveness, while the limited time daily effective for memorizing and retention seems to remain fairly constant. Although it is likely that the greater time spent by some individuals in initial memorizing may be balanced by less time required for review, there is little doubt that in exceptional cases there will be little opportunity for specialization. In the case of the great mass of individuals, however, general education and specialization will parallel each other, and in each the fundamental problem is the determination of the relationships which must be memorized and retained. In each they must become mechanical in their operation. In each, simple sequences and habits must be transformed into those that are increasingly complex. Impressions will re-enforce them. Partial concepts will form apperceiving centers for them, until through their many-sided and continually recurring relationships, supplemented by the habits necessary to their general application, they are carried over with constantly increasing frequency into the various fields in which they are useful.

7. *The "Old" Education and the "New" Complementary Parts of the Ideal Whole*

What general discipline demands is not abstract relationships, but relationships usefully general; not concentration upon one or two branches, but concentration upon a limited number of relationships; not remoteness from every-day life, but many-sidedness and continuity of relationship with what is most essential to life; not continuity through specialization alone, but through the domination and reorganization of individually apperceived experience, primarily and permanently by the common content most directly useful to all, and less persistently by the frequently changing vocational or academic specialty most directly useful to each individual. The mechanics of learning are not confined to

alphabets, multiplication tables, theorems and vocabularies, but include all specific relationships that a fully educated man must remember by and think with. Herbartian apperception and interest are not a substitute for mechanical repetition, but a necessary complement to it. The first step toward certainty of usefulness for ideas and activities, whether specific or general, is unvarying memorizing, accumulation, organization, and review of a few essential relationships, and the second, varying apperception of each idea and activity in a thousand and one different relationships, including and emphasizing those which associate it, even though temporarily, with the essential content. It is in this sense that the old education, with its memory drill, and the new, with its apperception and interest, are but complementary parts of the ideal whole.

The maximum time available for memorizing and retention, whether expended wholly in general education with the few or in general education and specialization with the many, is determined by physiological and psychological conditions. The minimum time—probably well within this maximum, but necessarily within it—is determined by the number and complexity of the relationships so essential that they must be permanently retained.

Over and above this maximum and minimum is a relatively greater length of time that is not effective for memorizing and retention. Here apperception and interest have free play. Here individuality retains and interprets. By far the greater portion of the course of study consists of the optional material which may or may not be remembered, and which, if retained at all, will be retained in relationships varying with individuals and determined by the mental content which happens to be dominant. It is here that the Herbartian five formal steps seek to ensure, direct and control individual apperception. But both in the formal recitation and in incidental experience, individuality will dominate, if definite and specific relationships, supremely

**Individual  
appercep-  
tion must be  
dominated  
by certainly  
useful  
system.**

useful, have not been made certain and dominating through adequate and continuing repetition, accumulation, and application. All of the relatively less useful material of education must be presented as many-sidedly as possible, not merely in relation to life, but to them. While it will none the less, for the most part, be retained in other relationships, individual and uncontrolled, it is far more likely, on account of such useful presentation, to be recalled in some useful relationship or, however recalled, to serve through its temporary and uncertain many-sidedness as the means to useful inference or application. An idea so presented may sink to the dead level of mere information, but is far more likely to serve through the many-sidedness thus made possible as a connecting link between the habits and sequences formed through specific discipline, and the fields of knowledge and experience in which they can be most usefully applied, than if it is presented in its academic relationships alone, or even in a many-sidedness not specifically useful.

8. *Continuity and Concentration Through Specialization Must Supplement Direct Preparation for Life in General and Be Related to It*

The solution, then, of the educational problem does not lie in reaction—in concentration and continuity through academic and vocational specialization; not in vocational schools that exclude culture and assume the continuity of the general education that precedes them; not in cultural institutions which, boasting of their lack of relationship to life, assume continuity for their subject matter after its formal study has ended. It rather lies in the paralleling of general education and specialization, and the relating of each as fully as possible to life; in distinguishing in each between the material which is most useful through its many-sidedness and recurrence and that with useful relationships which are less many-sided and recurring; in the persistent and mechanical repetition of the relatively most useful material, both of general education and specialization, in the definite relationships which make it

most useful; in the continuity of instruction and effective pedagogical method that will primarily so organize the essential material required in common of all as to make it the means both to a democratic culture and the useful accumulation and reorganization of all other experience, and, secondarily, so reorganize the essential material of specialization as to make it the means to a specialized culture and to the useful accumulation and reorganization of all experience useful within its peculiar field; in ensuring the conditions necessary to as general discipline as is possible and useful; in so relating the material relatively less useful for both common education and specialization to that which is relatively most useful in each, as to make many-sidedness the connecting link between individual experience and discipline.

To such a solution of the problem the method peculiar to a particular branch of knowledge is inadequate. Scientific method is an educational end, not a means, and is dependent upon pedagogical method for its effective development. Its organization has no other aim than that of the science of which it is a part. It may result in habits useful enough to be generally applied, but is unable of itself to ensure their general application in other fields. Except in so far as its relationships are themselves directly useful, it ignores preparation for life. Mastery of its method, however unpedagogically it is brought about, may result in an admirable mental discipline adequate to the discoveries and inventions which advance the boundaries of human knowledge and the noble form of specialization which seeks knowledge for the sake of knowledge. But the usefulness of a branch of knowledge to the race through the specialist cannot determine its place in the course of study or compel its study regardless of its specific relationships. Whether from the standpoint of discipline or of direct preparation for life, its usefulness to mankind in general, to specialists in other fields, and even to those who specialize in it without making it a life vocation, is dependent upon the

**The method peculiar to a particular branch of study an educational end rather than a means to education.**

selection and organization of those of its relationships most directly useful in life in general or in the specialty. On them are dependent the continuity of its habits, the opportunities for their application, the extent to which it reorganizes everyday experience, as well as its more certain and specific usefulness. To teach a subject for its disciplinary value alone is to defeat the disciplinary aim itself. Whether taught only in part in order that all material not directly useful to life in general may be excluded, or taught as a whole from the standpoint of vocational or academic specialization, the part directly useful to life in general or to vocation must be persistently related to everyday experience. Even where the organization peculiar to the branch as a whole and not so related is retained through formal instruction, it will remain, as John of Salisbury said of scholasticism, "of itself apart," unapplied and useless as a reorganizing force. To the masses, chess, bridge whist, or the puzzle column of a Sunday newspaper would be equally remote from life and as truly disciplinary.

When religion, morals, health, general industrial efficiency, social service, and citizenship are taught through as specific relationships and complex an organization as mathematics and the languages, they will not only be as disciplinary in the old narrow sense, but general application of their more useful habits will be assured, and life and character dominated by the ideals of education and of Christian civilization.

9. *The Development of Education as a Science Necessary Both to Democracy and Christian Civilization*

To such efficient teaching of each phase of life required of all individuals in common and of each branch of knowledge as the subject of individual specialization, adequate pedagogical training is indispensable. It is, indeed, far more necessary that the specialist should be a teacher, than that the teacher should be a specialist. The great investigator should pass on his results and his methods to a group of students; the teacher needs to be kept alive by the spirit of research.

But no scholar should teach in ignorance of such results as the science of education has already achieved, and no other science should be regarded as a more sacred field for patient and persistent achievement. The civilization of one generation has but narrowly completed its task when, through specialist and recorded knowledge, it passes on to the next the spiritual inheritance of the race, together with its own addition to it. The educational function of democracy and of modern civilization is far broader. They must ensure to every individual those phases in this inheritance which will most certainly secure his individual well-being and that of society. Ample provision has been made for academic research and the perpetuation of its triumphs. The specialized scholarship of the future is secure. But as yet small provision has been made for the development of the science without which the educational aim cannot be realized for and through the masses, the immense sums spent in popular education will be relatively wasted and the only true civilization—the civilization of the whole of society—will be immeasurably retarded. While groups of experts provided by national governments are solving scientific and industrial problems in every known field of material progress, through a blind trust in the infallibility of scholarship these tremendous educational issues are left to academic disputation and individual or institutional solution. Surely the time cannot be much further delayed when, with national sanction and support, the men whose training and experience have best fitted them for the task of inductive educational research will consecrate their time and energy to the advancement of the science on which the future happiness of humanity most directly depends, and through which each individual can enter most fully into the rights and duties of democracy and civilization.

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